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CSO BULLETIN

A publication of the Massachusetts Water Resources Authority's Sewerage Division

Volume 3, Issue 1
Spring 1995

CSO projects along the Mystic River include new dechlorination equipment at the Somerville Marginal facility to reduce residual toxicity in receiving water.

Finalizing CSO control alternatives

The Massachusetts Water Resources Authority has completed a Final Combined Sewer Overflow Conceptual Plan and System Master Plan that recommends $370 million in long-term CSO controls and improvements. The report calls for 28 projects in five major receiving water areas. The CSO projects will be implemented between now and 2011, with high priority given to critical areas where swimming, shellfishing and other recreational activities take place.

The final plan is the third phase of the MWRA's CSO control effort. Facility improvements reduced CSO volume by 55 percent between 1988 and 1992. Completion of the new Deer Island treatment plant and System Optimizations Plans (SOPs) will lower the discharge volume an additional 15 percent compared to 1988 conditions. The new plan will result in a total of 84 percent reduction in CSO volume over 1988 with 94 percent of the remaining CSO discharges receiving screening and disinfection at a minimum.

Details of the plan

The plan consists of 28 projects located in Boston, Cambridge, Somerville

(Control alternatives/Continued next page)

SYSTEM MASTER PLAN

The CSO Conceptual Plan is an integral part of the comprehensive System Master Plan (SMP), which is based on the first thorough examination and metering of the entire sewerage system. The Final SMP includes recommendations for CSO control and addresses ways to reduce infiltration and inflow (I/I), interceptor relief, secondary treatment capacity and other changes in the design and operation of the MWRA's collection system. The proposals are based on actual data collected from almost 200 flow meters that yielded a continuous record of how the collection system works.

Copies of the System Master Plan are available in repositories in Boston and at CSO community libraries. Executive Summaries of the plan are also available from the MWRA. Contact Lise Marx of the CSO program at (617) 242-0230.

CHRONOLOGY

AUGUST 1987
U.S. District Court orders MWRA to develop a CSO Facilities Plan

AUGUST 1989
EPA issues a national CSO strategy

SEPTEMBER 1990
MWRA submits CSO Facilities Plan to court. Plan recommends a regional tunnel system

JANUARY 1992
MWRA and EPA negotiate a short-term schedule for data collection and development of System Optimization Plans

JANUARY 1993
EPA issues draft CSO policy

FEBRUARY 1993
Interim CSO report submitted to EPA/CLF showing the need for re-evaluating the tunnel system

JUNE 1993
System Optimization Plans (SOP) for the four CSO communities are submitted to EPA

SEPTEMBER 1993
SOP implementation plan completed

DECEMBER 1993
Baseline CSO-flows report submitted

MARCH 1994
Baseline water-quality analysis completed

JUNE 1994
Alternatives for CSO control completed

SEPTEMBER 1994
Draft plan for CSO control and draft System Master Plan released

(Chronology continued page 4)

*(**Control alternatives** Continued from page 1)*

and Chelsea. It provides for control of CSO overflows from 81 outfalls into Boston Harbor and its tributaries and provides the highest levels of control for waterbodies used for swimming, fishing, shellfishing and other recreation. The recommended plan includes:

- **Elimination** of CSOs discharging to the beach and shellfishing areas in Dorchester Bay, the Neponset River Estuary and Constitution Beach;
- **Reduction** of untreated overflows in other waterbodies (only four or less per year will remain in each area);
- **Improved overflow treatment** by upgrading existing CSO treatment facilities and constructing six new CSO treatment facilities. When sewer separation is completed, CSO facilities at Commercial Point, Fox Point and Constitution Beach will be decommissioned;
- **Near-surface storage** facilities in segments where CSO flows are a significant percentage of the total flow to the waterbody;
- **Control of floatables** at all outfalls that will continue to discharge CSOs.

With one exception, the plan involves separate CSO controls for each of the 14 defined receiving water segments, rather than a single system-wide solution. The exception is a screening and disinfection facility on the Reserved Channel that will handle consolidated overflows from both Reserved Channel and North Dorchester Bay. Otherwise, the plan includes a variety of controls, such as interceptor relief, upgrading of existing CSO storage and treatment facilities, sewer separation and new screening and disinfection facilities. The plan takes into account the effects of projected infiltration/inflow (I/I) reductions and interceptor improvement projects that were recommended as a result of detailed hydraulic analyses of the entire MWRA sewerage system. The CSO plan is also consistent with the MWRA's recent proposal for 3 batteries of secondary treatment at Deer Island.

Update on project changes

Between the release of the draft plan in September and the final version in December, public comment and additional technical evaluations of the proposals resulted in some changes and refinements in the recommendations. (These technical changes can be compared to the entire list of elements in the winter ***CSO Bulletin***.)

Control of floatables from discharges is an important component of all of the larger CSO control projects, but it is also mandated at any outfall expected to remain active. The final plan includes the addition of floatables control as the primary control measure at 38 outfalls that are expected to discharge four or fewer times per year. Various types of floatables control technologies will be evaluated. The local CSO communities will select appropriate alternatives.

In the **Upper Charles River**, two additional screening and disinfection facilities were initially proposed. One of these was located in Cambridge (CAM009) and one was in Boston (BOS032). The Cambridge facility was eliminated because it was determined that CAM009 is expected to overflow only once in a typical year and floatables control was determined to be the most appropriate and cost-effective technology. At BOS032, it was determined that increasing the size of the connection to the MWRA system would reduce the frequency of overflows from 10 per year to four per year and would

*(**Control alternatives** Continued next page)*

The Cottage Farm CSO facility will be upgraded with new effluent screens, an outfall diffuser and dechlorination equipment.

reduce the volume of discharge from approximately 1.92 million gallons to 20,000 gallons per year. Floatables control only will also be installed at the BOS032 outfall.

In the **Lower Charles River**, the Authority had proposed locating a new screening and disinfection facility in the downstream end of the Stony Brook tributary area. Based on public comments, the facility may be located further upstream in the Stony Brook system. An upstream facility can screen and disinfect flows that will discharge at BOS046 into the Back Bay Fens approximately twice per year. In the draft plan, these flows did not receive treatment.

In the **Alewife Brook** area, the final plan added additional sewer separation in the area tributary to the CAM002 outfall. This further reduces the volume of flow in the MWRA system, thereby reducing the number of overflows at other CSOs along Alewife Brook. In Somerville, common manholes between sanitary and storm drain systems will be blocked, which will eliminate the possibility of either system overflowing into the other. Overall, these changes will reduce the frequency of overflows into Alewife Brook to four or fewer per year.

Three-month storage was recommended for the **Upper Mystic River** in conjunction with Massachusetts Highway Department plans to relocate the Somerville/Marginal CSO treatment facility. Comments on the plan suggested that continued operation of the facility with the addition of dechlorination would be nearly as effective as building a new storage facility. It is unclear whether MHD will still have to relocate the existing facility. In the Upper Mystic River, SOM006 was identified as potentially active after the draft plan was released. Common manholes will be separated in the tributary area if necessary to eliminate this CSO outfall.

At the confluence of the **Mystic and Chelsea Rivers**, two outfalls were reassessed (BOS014 and CHE008). The East Boston screening/disinfection facility will not be necessary since there is only a small flow there annually, which will be screened. Interceptor relief in the Chelsea Branch Sewer will eliminate the need for another facility, but some investigation of the structure of the outfall (CHE008) will take place based on comments on the draft report.

The Environmental Notification Form

The Authority submitted an Environmental Notification Form (ENF) on the CSO Project to the Massachusetts Environmental Policy Act (MEPA) Unit in April. MEPA initiates the formal public review process that sets out the scope of work that will be done in the Environmental Impact Report (EIR).

The ENF summarizes the CSO control plan and provides a detailed description of the proposed projects. Because this is a complicated project with varying degrees of complexity and environmental impact, MWRA has suggested different levels of environmental review for different elements. In the ENF, the Authority proposes that projects with limited impacts be allowed to proceed without additional review. This request includes sewer separation projects, upgrades to existing facilities, region-wide floatables control, in-line storage in the existing Dorchester Brook Conduit, outfall repairs at one Chelsea overflow and a small scale interceptor relief project along the Charles River in Boston. If this waiver request is granted, more

***(Control alternatives**/Continued next page)*

immediate water quality benefits will be realized through early implementation of selected projects.

The MWRA also asked the Secretary of Environmental Affairs to designate the CSO Project as "major and complicated" and this was granted on May 30, 1995. This status allows flexibility to perform different levels of environmental assessment for different project components. It will also allow for easier coordination with the Department of Environmental Protection and any regulatory issues relative to the state water quality standards. The project will also receive additional oversight by a Technical Advisory Committee designated by the Secretary.

The MWRA expects to complete an EIR for CSO control projects that require siting facilities and will identify the potential environmental and community impacts connected with each project. The Authority expects that these and other projects will undergo full MEPA review between now and mid-1997.

It should be noted that even if projects do not require further MEPA review, there will be an opportunity for public review and comment during the local and state permitting processes required prior to construction.

Next steps

Once the scoping process has been completed in June 1995, work will begin on the identification of potential sites and conduit alignments. A site assessment report that evaluates potential sites and defines preferred site options will be available late in 1995 for public review and comment.

In addition, the MWRA plans to begin meeting with a number of neighborhood working groups in the fall. These groups will have an opportunity to discuss site-specific issues and help develop solutions for potential local concerns. Although plans are still preliminary, the Authority expects to work with neighborhood organizations in the following areas: (1) South Boston; (2) Alewife / Mystic; (3) Inner Harbor / Charlestown; (4) Union Park Area; (5) Charles River; (6) Stony Brook; (7) Chelsea; (8) East Boston; and (9) South Dorchester / Neponset.

If you are not currently receiving notices of working group meetings and would like to participate in a group in your neighborhood, please call Vincent Ragucci of the MWRA's Public Affairs Department at 241-6057, ext. 1191, or Lise Marx, CSO Program, at 242-0230.

Implementing the plan

The CSO Conceptual Plan assumed that some of the recommended projects will be implemented by the Authority and others will be implemented by the CSO communities. MWRA responsibilities will include Facilities Planning and

(Control alternatives/Continued last page)

CHRONOLOGY CONTINUED

DECEMBER 1994
Final conceptual plan for CSOs and System Master Plan completed

APRIL 1995
Environmental Notification Form filed for recommended CSO projects
Commenced CSO Facilities Plan/EIR

MAY 1995
MEPA scoping of CSO projects

SUMMER 1995
Siting investigations continue
Projects not requiring environmental impact review move to design and construction

FALL 1995
Site assessment report released
Neighborhood working groups meet

M&E wins planning award

Metcalf & Eddy, Inc. has received two national awards for its role in developing the Massachusetts Water Resources Authority's recommended plan for CSO control. The awards are:

- *Grand Prize for a Planning entry in the 1995 Excellence in Environmental Engineering competition sponsored by the American Academy of Environmental Engineers; and*
- *Honor Award in the 1995 Engineering Excellence Awards competition sponsored by the American Consulting Engineers Council.*

Both awards recognize that the recommended plan represents a comprehensive, integrated solution that successfully solves the complex problems associated with CSO control in a large system. The watershed approach and detailed system modeling used to develop the plan were judged to be original and innovative and of technical value to the engineering profession. The $928 million cost savings that the plan provides for the Authority's ratepayers was deemed a significant social/economic benefit.

Looking at the watersheds

The recommended CSO control plan is a watershed-based approach that targets real water quality improvements at a reasonable cost. The final version recommends projects in five water basins (or 14 receiving waters): Dorchester Bay and the Neponset River; Constitution Beach; Charles River; Alewife Brook and the Upper Mystic River; and Boston Harbor.

Future issues of *CSO Bulletin* will feature reports on each of the other receiving waters and details of the Facilities Planning and EIR process.

Dorchester Bay and the Neponset River

The highest levels of control are proposed for urban beach and shellfishing areas along North and South Dorchester Bay and the Neponset River and at Constitution Beach in East Boston. In Dorchester Bay, this means relocating the flow from all of the CSOs to Reserved Channel. For most storm events, this flow will be stored and eventually pumped to the Deer Island plant for treatment. Several times a year, however, flows will pass through a screening and disinfection facility and discharge to Reserved Channel. To accomplish this, it will be necessary to construct a large diameter pipe known as a consolidation conduit to collect flow from the existing systems along the beach. A new disinfection facility will also need to be sited along Reserved Channel. (A second conduit along Reserved Channel will pick up existing CSOs from the upstream end of the channel.)

In Southern Dorchester Bay, sanitary sewers and storm drains will be separated. This will reduce the number of annual overflows from 78 to 0 when all of the work is completed. Overflows that reach sensitive shellfishing areas in the Neponset River will go from 17 a year to 0, also through sewer separation. Some additional hydraulic work planned for this area will bring the estimated cost to approximately $192 million.

Over the next decade, Alewife Brook will see new construction that will improve water quality.

Constitution Beach

A similar level of control is proposed for Constitution Beach, where sewer separation will help to restore this critical use area. The existing Constitution Beach CSO facility will be decommissioned. Eliminating the 16 overflows that now take place each year will ensure that there are no CSO-related beach closings. The estimated cost for separating approximately 37 acres for this project is $9 million.

Alewife Brook and Mystic River

The Alewife Brook is classified as a fishable/swimmable waterbody with no designated critical uses. Fishing and canoeing are the most likely recreational activities on this narrow brook. The plan recommends separating the tributary areas upstream of two outfalls through construction of either new storm drains or new sanitary sewers and providing screening at eight other outfalls. The Upper Mystic River includes the Mystic River between the southern end of Mystic Lakes down to the Amelia Earhart Dam. The Alewife Brook is a tributary to the Mystic River. Separation of baffle manholes is recommended for this area. This typically involves short-term work in local streets to either separate sanitary sewer lines and storm drain lines within existing manholes or to route one line into a newly-constructed manhole. The plan also recommends continued treatment at the Somerville Marginal CSO facility, which would be upgraded to add dechlorination. Work in these areas is expected to cost approximately $13 million.

Photos by Karen-Jayne Dodge

QUESTIONS?

The Authority invites comments on the Draft CSO Conceptual Plan and System Master Plan. Please mail your letters to Lise Marx, MWRA CSO Program, 100 First Ave., Charlestown MA 02129. If you have questions about the project, would like further information or would like to be added to the mailing list, please call Vincent Ragucci of the MWRA Public Affairs Department at 241-6057 ext. 1191, or Lise Marx, CSO Program, at 242-0230.

Coming next time...

- **Scope of environmental review**
- **Implementation update**

(Control alternatives/Continued from page 5)

agency review of all projects, as well as design and construction of projects that will be owned by the MWRA. MWRA facilities include new sewers and storage conduits that upgrade existing MWRA sewer capacity; any new or upgraded CSO treatment facilities; and floatables control projects serving MWRA outfalls.

CSO communities will be responsible for managing all permitting, design and construction of projects that will be owned by the communities, including improvements to local systems, such as new sewers or storm drains constructed as part of separation projects, and floatables control projects that will serve community-owned CSO outfalls.

Under this plan, about $130 million of the total $370 million in projects will be implemented by CSO communities, although all capital costs for CSO project planning, design and construction will be funded under MWRA's Capital Improvement Program.

CSO projects have the potential to be impacted by construction, including the Central Artery/Third Harbor Tunnel and other infrastructure improvements. Staff will coordinate plans with other agencies to tie MWRA efforts with other construction. These arrangements may affect the implementation of some projects.

More details of the implementation schedule will be available in the next *CSO Bulletin*.

Printed on recycled paper.

CSO
BULLETIN

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Authority
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Boston, MA

MASS. WRA1.12: vol.2/no.1

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CSO BULLETIN

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Volume 2, Issue 1
Spring 1994

Combined sewer overflow policy evolves

At the turn of the century, combined sewer systems were the cutting-edge in sewer technology. They removed wastewater and runoff from streets and backyards and "modernized" communities across the nation. Ninety years later, more than 1,100 cities nationwide face the task of limiting these wet-weather discharges that pollute receiving waters and force beach and shellfish-bed closings.

Because they were not regulated or were hard to control, CSOs were ignored by communities and regulators for years. After passage of the federal Clean Water Act and its amendments (1972 and 1977), many cities focused first on upgrading or building new secondary wastewater treatment plants. By the time they turned to CSOs, federal grants had ended and recessions had tightened state and local budgets.

Lynn's Water & Sewer Commission is beginning a long-term plan to relieve pollution caused by these CSOs, among others.

A new national policy

The Environmental Protection Agency recently issued a policy governing CSOs. The policy recognizes that CSOs are an intermittent wet-weather problem as complex and often as costly to resolve as continuous dry-weather discharges. The two-phase policy (1) gives communities two years from enactment to meet nine control standards

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WHAT ARE CSOs?

The sewer systems in Boston, Chelsea, Cambridge and Somerville collect sanitary sewage from homes and businesses in the same pipes used to collect stormwater runoff. This is called a combined sewer system. During dry weather, when only sanitary sewage is entering the pipes, the system can handle the flow and transport it to Deer Island for treatment. In wet weather, the addition of stormwater overloads the system. At the same time, MWRA interceptors experience heavier flows due to inflow and infiltration from upstream communities. For these reasons, in wet weather the combined sewage and rainwater can back up and flow into the harbor and connecting rivers through 81 active combined sewer overflows (CSOs) in four communities. This flow contributes to the pollution of local waters, violating federal and state water-quality standards. Currently, about 50 percent of these flows receive some limited treatment before being discharged. These four cities are not alone with this problem. Over 1,000 U. S. communities have similar combined systems and resulting water-quality problems.

PUBLIC REVIEW AND COMMENT

MWRA Public Affairs and CSO program staff will meet with CSO working group members, local officials and other interested groups and citizens as CSO reassessment elements and Master Planning documents are prepared for review and comment. Watch the next CSO Bulletin and notices for dates, times and locations for meetings to review system-wide CSO control alternatives. Also check your local library for these CSO publications:

DECEMBER 1993
- ***Baseline CSO Flows Report***

MARCH 1994
- ***Baseline CSO Water-Quality Impacts Report***

MAY 1994
- ***CSO Bulletin***

JUNE 1994
- ***Alternatives for CSO Control, Initial Interceptor, I/I and Secondary Treatment Strategies***

JULY 1994
- ***CSO Bulletin***

SEPTEMBER 1994
- ***Draft Conceptual Plan for CSO Control***
- ***Draft System Master Plan***
- ***CSO Bulletin***

DECEMBER 1994
- ***Final Conceptual Plan for CSO Control***
- ***Final System Master Plan***

(CSO policy/Continued from page 1)

that can reduce some CSOs simply and inexpensively, and (2) calls for development of a long-term control plan for remaining CSO discharges. The plan should include system and treatment-plant optimization; phased implementation schedules; special consideration for sensitive areas, such as beaches; and public input in the process. As part of long-term plan development, the EPA will consider the revision of water-quality standards for extreme wet-weather conditions. The new policy is ambitious, but based on reality. Communities will have flexibility and time to implement improvements designed for their specific circumstances, measure their effects and avoid large, and perhaps unnecessary, costs.

"The new policy gives the MWRA flexibility in controlling CSOs by implementing low-cost, high-return options first, assessing the results, then phasing in any other necessary improvements," said Douglas B. MacDonald, MWRA Executive Director. "Our System Optimization Projects (SOPs) will reduce many CSO discharges and improve water quality while we determine the most cost-effective approach to long-term CSO control."

The new policy offers communities the flexibility to address problems such as infrequent but large-volume wet-weather overflows with practical solutions. For example, the MWRA might devise a CSO-control system that meets water-quality standards except for rare, large-volume storms. The regulations now allow the EPA to consider the cost burden on a community to meet water-quality standards 100 percent of the time. In another instance, stormwater discharges and nonpoint pollution sources and runoff might contribute to watershed pollution, which the MWRA, for example, cannot control. A "use attainability study" would be undertaken to assess how to best meet water-quality standards most of the time.

The guidelines provide two different policy umbrellas in which to handle CSOs – *presumptive* versus *demonstration* approaches. The presumptive approach works as its name implies: the plan "presumes" that a community will meet water-quality standards if specific technical criteria are met. EPA's Region 1 – which includes Massachusetts – is encouraging use of the more flexible demonstration approach. In this case, the MWRA would perform extensive modeling and testing to "demonstrate" that any proposed CSO-abatement strategy will work.

MWRA Sewerage Division Director John F. Fitzgerald noted, "Because the MWRA was active in developing the new policy, our demonstration work is well underway. We look forward to working with all interested parties to develop a plan that both improves environmental quality and is responsive to ratepayers' concerns."

Clean Water Act reauthorization

CWA reauthorization has received a burst of interest from the Clinton Administration and Congress. Versions of a bill are likely to progress through the Congress this year. Reauthorization takes place at a time when interest groups – including environmentalists, business and municipal groups, regulatory agencies and ratepayers – appear to agree that water-quality goals should include

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targeting priorities that are consistent with the resources available to communities and with receiving-water uses. The new bill should address wet-weather issues such as nonpoint source pollution (which comes from a variety of hard-to-locate sources, including up-river sources), stormwater, watershed management, funding and enforcement, pretreatment/pollution prevention and wetlands.

Funding remains a major difficulty for most cities and towns facing CSO remediation. Communities are urging Congress to provide grants and to expand low or no-interest loans to support CSO-control programs in line with the EPA's approach. The CSO Partnership, a coalition of CSO municipalities, has proposed setting a 1.5 percent cap on the percentage of median household income that a community would be mandated to spend annually on CSO-mandated improvements.

Cities and communities around the nation are facing very high costs for CSO remediation. San Francisco has already spent more than $1 billion since the 1970s and anticipates another $250 million in CSO projects. Grand Rapids, Michigan, began its CSO program more than 10 years ago and is beginning the second phase of work that calls for sewer separation of 65 miles of pipes at a cost of $150 million. Nashville and Cincinnati are assessing CSO handling options that are equally expensive.

Other state CSO projects

In 1992, EPA estimated that it would cost about $42 billion to abate CSO pollution nationally. More than six percent of these dollars would be spent in Massachusetts, where cities and towns face about $2.6 billion in improvements to control combined sewer overflows. Money from the state Revolving Fund (SRF) is assisting some of this work. A percentage of the SRF is dedicated to forgiving principal for disadvantaged communities. Lynn, New Bedford, Fall River and Chicopee are currently in different stages of CSO planning and construction.

Boston Harbor Project construction on Deer Island. New wastewater treatment facilities will allow the MWRA to meet Clean Water Act standards for the first time.

The Lynn Water and Sewer Commission has begun work on parts of a $138 million (in 1990 dollars) long-term plan to relieve the pollution of Broad Sound. The plan includes some sewer separation, storage and treatment of wet-weather flow, new tidegates and reduction of infiltration and inflow. An economic impact-analysis is in final stages of review as the project gets underway.

In Fall River, CSOs impact Mt. Hope Bay and the Quequechan and Taunton Rivers. The control plan calls for storage, disinfection and chlorination of wet-weather flows through a $115 million project that will also help relieve capacity problems in major trunk sewers. Nineteen CSOs will be eliminated and one overflow point maintained during extreme rainfalls.

In New Bedford, $170 million in CSO improvements have been recommended in addition to new secondary treatment facilities construction.

The Pioneer Valley Planning Commission in West Springfield has undertaken a demonstration project using wetlands for CSO handling. The EPA-funded project diverts flow into wetlands and includes pretreatment for grit and screenings. Land use for treatment is common in the south, west and Midwest where larger open space plots are available.

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Taking the long view

*The public hears a great deal about the MWRA's efforts to build a sewage treatment plant, but may not know the Authority's plans for handling sewage over the next few decades – the life of the new equipment. **CSO Bulletin** met recently with Mike Domenica, director of the new Sewerage Facilities Development Department, to find out what's happening in long-range planning for collection and treatment systems. Domenica is a professional engineer with 23 years of private-sector experience in water-resources management in the U.S. and South America.*

CB: What is the new department's mission?

MD: Our job is to plan and control the Authority's investment in sewerage facilities. Right now, this translates into developing a Master Plan for managing the whole sewerage system, focusing on CSOs, infiltration/inflow, interceptors and the effects of these flows and loads on the new secondary treatment plant. Completing the System Master Plan is the first job we've undertaken, and it's a big one.

CB: What are the Authority's other major objectives?

MD: We have four objectives: (1) to use new state-of-the-art analytical tools to integrate planning, design and operation of sewerage-system components; (2) to prepare a comprehensive long-range plan for the Sewerage Division; (3) to develop and computerize high-quality data bases and systems – such as flow metering and mapping – that will support our work; and (4) to be involved in the development of state and national policies that affect MWRA planning and operations.

CB: Who's on your team?

MD: CSO-community residents and officials will become familiar with three Senior Program Managers who lead major Sewerage Facilities Development Department efforts: Dave Kubiak is responsible for developing the System Master Plan, including the long-term CSO-control program; Carl Leone heads the I/I Program that focuses on the system-metering program and I/I reduction; and Dick Kobayashi and John Corliss lead the efforts to develop analytical tools and apply them to preparation of the Division's Long-Range Plan. The three programs complement each other perfectly by providing the tools, technology and information needed to effectively plan the Division's major strategies for the next several decades.

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SEPTEMBER 1994
Draft plan for CSO control and draft System Master Plan

DECEMBER 1994
Final conceptual plan for CSOs and final System Master Plan

Update: System Master Planning

The Authority is continuing to develop long-term CSO-control plans. The project began in 1992 with data collection and efforts to fully understand and characterize the CSO system. This information, which incorporated the beneficial effects of improvements already made to the MWRA wastewater system, was used to develop low-cost system optimization measures and intermediate projects as first steps. Work is now proceeding on the System Master Plan.

The MWRA's System Master Plan (SMP) covers more than CSO control and remediation. It will include strategies to upgrade the entire system, including: reducing infiltration and inflow (known as I/I), groundwater that leaks into pipes and brings extra flow to the treatment plant; improving interceptor performance (the large pipes that carry wastewater out of individual communities and into the MWRA's system); and assessing the effects of new CSO flow information and treatment requirements on the Deer Island treatment plant.

Scenarios for handling these issues will be combined in a draft report – including CSO strategies – that will be available for public review and comment in June. After public comment and revisions, the MWRA will issue a draft System Master Plan in September. After another round of comment and revisions, the Final SMP document should be completed by December 30, 1994. The next step will be to begin facilities planning and environmental investigations.

CSO AND MASTER PLANNING LIBRARY REPOSITORIES

Reports and draft and final plans for CSOs and the System Master Plan will be available in the reference departments of the following libraries between now and the end of the year. If you have any questions, or are unable to find a document of interest, please call Lise Marx, MWRA CSO Program at (617) 242-0230.

BOSTON PUBLIC LIBRARY
Copley Square
Boston MA 02117

BOSTON PUBLIC LIBRARY
SOUTH BOSTON BRANCH
646 E. Broadway
South Boston MA 02127

BOSTON PUBLIC LIBRARY
ADAMS BRANCH
6990 Adams St.
Dorchester MA 02122

BOSTON PUBLIC LIBRARY
WASHINGTON VILLAGE
1226 Columbia Rd.
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64 Middlesex Ave.
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700 Massachusetts Ave.
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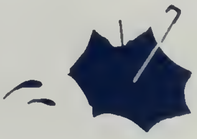
SOMERVILLE PUBLIC LIBRARY
79 Highland Ave.
Somerville MA 02143

STATE HOUSE LIBRARY
The State House
Boston MA 02133

WELLESLEY PUBLIC LIBRARY
530 Washington St.
Wellesley, MA 02181



Photos by Karen-Jayne Dodge

QUESTIONS?

The Authority will continue to hold neighborhood meetings periodically throughout the project. If you have questions about the project, would like further information or would like to be added to the mailing list, please call Vincent Ragucci of the MWRA Public Affairs Department at 241-6057 ext. 1191, or Lise Marx, CSO Program, at 242-0230.

(CSO policy/Continued from page 3)

Current MWRA efforts

At their February 16, 1994 meeting, the MWRA Board of Directors approved $342,900 to implement the first group of 45 System Optimization Plan (SOP) measures. SOPs, which will be implemented over the next three years, are expected to reduce CSO-discharge volumes by up to 25 percent.

Recently, the MWRA completed a baseline CSO-flow report (copies are available in libraries throughout the MWRA system). The report defines the Boston area's long-term CSO-control needs by predicting flow-discharge amounts from every CSO under certain conditions. The effects of other system improvements, such as the new Deer Island treatment plant, are figured into baseline flows.

The next step was to complete a baseline water-quality analysis that described the effects of remaining CSO discharges on receiving waters such as the Charles and Neponset Rivers. This report – available for review at local libraries – forms the basis for the long-term CSO-control plan.

The Authority plans to continue its public consultation process as the stages of the plan are completed. Watch for mailings and future ***CSO Bulletin*** issues for meeting dates and proposal summaries.

Coming next time...

- ***Master Planning: Combining Interceptor, Infiltration/Inflow, CSOs and secondary treatment strategies***
- ***CSO project update: control strategies for receiving waters***

Printed on recycled paper.

CSO BULLETIN

A publication of the Massachusetts Water Resources Authority

Volume 2, Issue 1
Spring 1994

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CSO BULLETIN

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Volume I, Issue 2
Summer 1993

A Boston Water and Sewer worker cleans and maintains a tidegate near the Tea Party Museum in downtown Boston, part of BWSC's ongoing maintenance of CSO outlets. (Photo by Karen-Jayne Dodge)

SOPs : Bringing out the best

For the past year, the Massachusetts Water Resources Authority has conducted a detailed investigation of its sewage transport system to Deer Island and combined sewer systems in Boston, Cambridge, Chelsea and Somerville. Data collected during 1992 and a new hydraulic model were used to develop System Optimization Plans (SOPs) for each of the four communities.

"These plans show that by making relatively low-cost modifications to the existing system, the CSO communities and the MWRA can send more flow to treatment facilities and reduce CSO discharge volumes by 25 percent," said Douglas B. MacDonald, MWRA Executive Director.

SOPs are relatively low-cost, easily-implemented structural or operational modifications that improve the transport capacity of the sewer system and reduce CSO discharges. The goal of the SOPs is to maximize the existing sewer system before turning to major construction projects for CSO control (as recommended in the 1990 CSO Facilities Plan). "We submitted SOP reports to the Environmental Protection Agency at the end of June," MacDonald said. "We're eager to see SOP implementation and the improvements these changes will bring to the system."

SOPs involve regulator modifications and a variety of other changes that will enhance the sewerage system's performance, especially during wet weather when the system is overburdened by a combination of sanitary- and storm-flow. A CSO regulator is a structure in the combined sewer that diverts wet-weather flow above a certain level to a downstream conduit (pipe) that leads to a CSO outfall. The SOP projects will either close these structures or alter the way they are operated. SOPs will modify existing pipes to allow them to store flows that previously would have discharged. The stored flows can then be transported either to a nearby CSO treatment facility or the Deer Island treatment plant.

(Continued on page 2)

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Nazzaro Center

EAST BOSTON
Harborside Community Center Auditorium

CHELSEA
Chelsea City Hall

ALEWIFE / SOMERVILLE
Powderhouse School

SOUTH BOSTON
Area C Police Station

BACK BAY
Neighborhood Association of the Back Bay

DORCHESTER
Dorchester House

WHAT ARE CSOs?

The sewer systems in Boston, Chelsea, Cambridge and Somerville collect sanitary sewage from homes and businesses in the same pipes used to collect stormwater runoff. This is called a *combined sewer system*. During dry weather, when only sanitary sewage is entering the sewer pipes, the system can handle the flow and transport it to Deer Island for treatment. In wet weather, the addition of stormwater in pipes overloads the system. At the same time, the MWRA interceptors experience heavier flows due to inflow and infiltration in upstream communities. The combined sewage and rainwater can back up and flow into the harbor and connecting rivers through 81 active *combined sewer overflows (CSOs)* in four communities. This flow contributes to pollution of local waters and violates federal and state water quality standards. Currently, about 50% of these flows receive some treatment before being discharged. These four cities are not alone with this problem. Over 1,000 U. S. communities operate with similar combined systems and resulting water quality problems.

(SOPs/Continued from page 1)

The SOP study found that the CSO outfalls and regulators are often interconnected. In some cases, sewage that normally flows through one regulator and outfall can flow to a nearby regulator and outfall under different conditions. This discovery helped the Authority's planners to identify hydraulically-related subsystems. The CSO communities are linked through eight of these subsystems.

This information — along with diagrams of the regulators, flow monitoring data, tidal influences and operational history — was fed into a computer model. The model simulated the way regulator modifications at one location could affect other hydraulically-connected locations, in order to avoid causing problems such as upstream flooding. The planners also evaluated proposed changes based on costs and benefits, and factors such as the ability to construct and operate the regulators.

SOP recommendations

SOP measures are recommended at 103 locations at an estimated design and construction cost of $3 million. The most commonly recommended SOP project is constructing or raising a weir (wall) in the CSO conduits (see diagram on page 3). This change instantly uses more of the system's capacity for storage and decreases CSO volumes and frequency of discharge. The table (below) lists other typical SOP projects and their benefits.

The MWRA and the four CSO communities are now preparing a plan to phase in recommended SOP measures. The implementation plan will establish SOP-improvement priorities and schedule design and construction work. Many of the projects can be completed by MWRA or community work crews.

Benefits of the SOPs

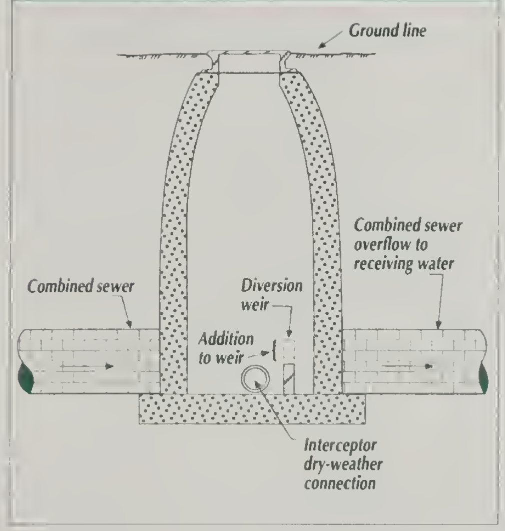
The SOP program will expand the efforts made by CSO communities over the last few years to improve system performance and meet the goals of the EPA's draft CSO-control policy. Specifically, SOP implementation is expected to result in the following:

- Lower discharge volumes at 34 outfall locations during a 3-month storm event.
- Reduce the total system-wide, CSO-discharge volume during a 3-month storm event by 25 percent.
- Reduce untreated CSO discharges by about 50 percent.

Typical SOP Projects and Benefits

Project	Benefit
Block overflow	Eliminates CSO outfall Eliminates permit requirements
Install/Raise Weir	Utilizes in-system storage capacity
Construct new regulator	Decreases CSO volumes/frequency Allows for staged implementation
Increase size of connection to interceptor	Increases flow to interceptor Decreases CSO volume/frequency
Replace tidegate	Reduces tidal inflow Increases system capacity for combined flows Decreases downstream CSOs

Typical diversion weir regulator


Ground line
Combined sewer overflow to receiving water
Combined sewer
Diversion weir
Addition to weir
Interceptor dry-weather connection

- Eliminate three outfalls and eight CSO regulators.
- Immediately benefit receiving-water quality.

The next step

Work is now proceeding on the SOP implementation plan, expected to be completed in September. The Authority will also prepare a report on the "baseline" conditions to be addressed by long-term CSO control. The report will take into account the effects of SOP implementation, Stony Brook investigations (the potential for removing Stony Brook stormwater flows from the long-term control plan) and identification of potential intermediate projects for CSO control. These projects, which will be larger in scale than SOPs, will also improve the existing system and result in significant sewer overflow reductions. The baseline-conditions report is expected to be available in January 1994. Work will also begin on the System Master Plan that will address system-wide needs. Public meetings will continue to be held regularly to present the results of ongoing work.

I/I Assistance Program begins

The Authority recently established a $25 million program to help member communities fund local Infiltration and Inflow (I/I) reduction projects. The two-year combination grant and loan program was established in conjunction with the MWRA Advisory Board.

Infiltration and inflow is a common problem in MWRA communities. I/I consists of ground and stormwater that enter the collection system through a variety of sources. High levels of I/I deplete collection-system capacity, which might otherwise be available to transport combined-sewer flows.

Key I/I program elements include:

- Allocation of $25 million among 43 sewer-service communities based on their percentage of the pro-rated FY 1993 wholesale sewer assessment.
- Distribution of funds for each approved project as 25 percent grants and 75 percent interest-free loans.
- Up-front distribution of financial assistance for approved projects.
- Repayment of the loan portion of the funding in five equal annual payments beginning one year after the funds are distributed.

The initial date for determining project cost eligibility was August 19, 1992. As of June 30, 1993 the Authority had received applications from 27 communities for a total of about $10 million in funding. Those projects would reduce infiltration and inflow by about 26 million gallons per day.

For program information, contact: Carl H. Leone, Senior Program Manager, I/I. (617) 242-0230, ext. 4356.

CHRONOLOGY

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JUNE 1993
System Optimization Plans (SOP) for the four CSO communities are submitted to EPA

SEPTEMBER 1993
SOP implementation plan due

JANUARY 1994
Completion of baseline conditions report

QUESTIONS?

The Authority will continue to hold neighborhood meetings periodically throughout the project. If you have questions about the project, would like further information or would like to be added to the mailing list, please call Vincent Ragucci of the MWRA Public Affairs Department at 241-6057 ext. 1191, or Lise Marx, CSO Program, at 242-0230.

CSO facts and figures

- The MWRA owns and maintains 230 miles of large interceptor sewers that receive wastewater from 5,400 miles of municipal sewers at over 1,800 separate connections. The collection system is divided into north and south, and 20 percent of the northern system contains combined sewers. Flows from the north system, which covers 168 square miles with a population of 1.26 million people, are delivered to the Deer Island plant for treatment.
- Six CSO treatment facilities at Fox Point, Commercial Point, Constitution Beach, Somerville-Marginal, Cottage Farm and Prison Point provide screening and disinfection for 50 percent of CSO total volume during wet weather.
- The Boston Water and Sewer Commission owns and operates 119 tidegates, 137 regulators and 45 active CSO outfalls. Cambridge owns 17 regulators and 11 active CSOs. Chelsea has 5 regulators and 4 active CSOs. Somerville has 22 regulators and 9 active CSOs.
- Tidegates and regulators are inspected frequently. Improved maintenance has helped reduce overflows. The oldest gates are made of wood with cast iron hinges; newer gates are made of iron or stainless steel with noncorroding parts.

Coming next time...

- ■ *A look at national CSO problems*
- ■ *SOP implementation schedule*
- ■ *Master planning progress*

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CSO BULLETIN

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Volume I, Issue I

Spring 1993

CSO PROJECT UPDATE

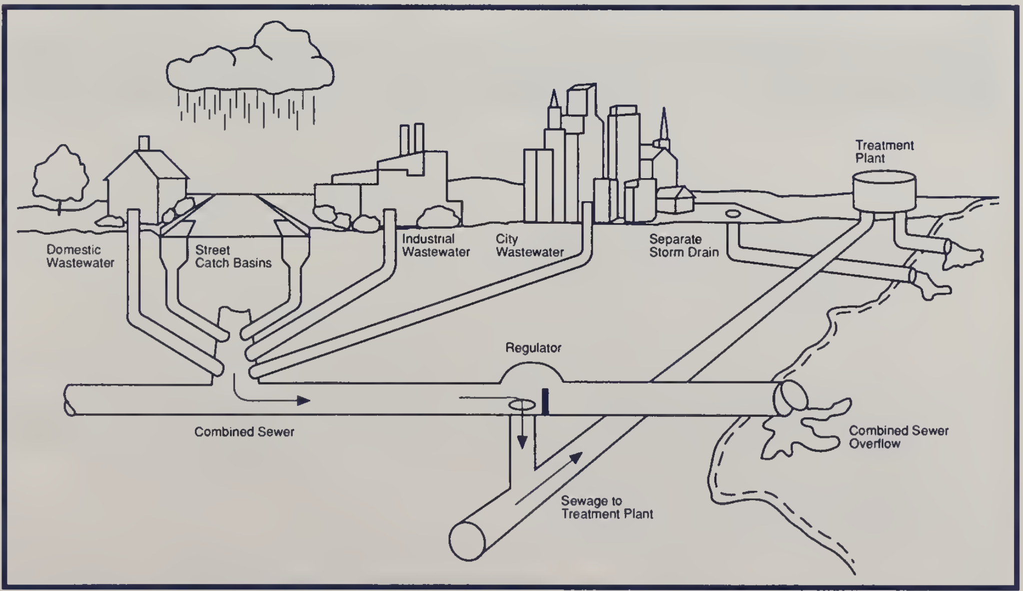
In compliance with a federal court schedule, the MWRA completed a Combined Sewer Overflow (CSO) Facilities Plan in September 1990 after two years of study and public review. Estimated at a capital cost of $1.2 billion, the plan called for construction of near-surface and deep-tunnel storage systems, and limited sewer separation in various CSO communities.

Although the plan met federal CSO control guidelines, certain factors caused the MWRA to reconsider the 1990 plan and ask the federal court for more time to consider other options. Information from the Authority's Advisory Board and from the four CSO communities of Chelsea, Cambridge, Boston and Somerville — including flow metering — led the Authority to believe that a less costly plan could be implemented. Those reasons are:

- improved pumping in MWRA and community systems meant that more wet weather flow was being transported to Deer Island, triggering the need to re-estimate 1990 plan flow predictions;
- the MWRA needed a master plan that would integrate improvements for the entire wastewater conveyance and treatment system, including CSOs, infiltration and inflow and interceptors.

The federal court granted the Authority one year to collect more data including the results of sewer system inspections and actual CSO-flow metering. A report summarizing data collection efforts and the impact of new information on the 1990 recommended plan was submitted to the EPA and the Conservation Law Foundation in February 1993.

(Continued on page 2)



In four Boston-area communities, sanitary sewage combines with stormwater during wet weather and can discharge into local waters. The MWRA is drafting a policy to control these combined sewers.

CSO WORKING GROUPS

MWRA public affairs and project staff meet with citizens in the following neighborhoods and communities. Meetings are usually held at the locations listed below and you are encouraged to attend. Watch for the next newsletter or a mailing notice for the next round of meetings.

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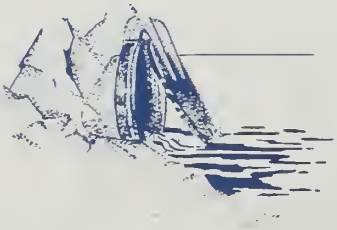
WHAT ARE CSOs?

The sewer systems in Boston, Chelsea, Cambridge and Somerville collect sanitary sewage from homes and businesses in the same pipes used to collect stormwater runoff. This is called a *combined sewer system*. During dry weather, when only sanitary sewage is entering the sewer pipes, the system can handle the flow and transport it to Deer Island for treatment. In wet weather, the addition of stormwater in pipes overloads the system. At the same time, the MWRA interceptors experience heavier flows due to inflow and infiltration in upstream communities. The combined sewage and rainwater can back up and flow into the harbor and connecting rivers through 81 active *combined sewer overflows (CSOs)* in four communities. This flow contributes to pollution of local waters and violates federal and state water quality standards. Currently, about 50% of these flows receive some treatment before being discharged. These four cities are not alone with this problem. Over 1,000 U. S. communities operate with similar combined systems and resulting water quality problems.



CSO OUTLET

(CSO PROJECT UPDATE / Continued from page 1)

FLOW MEASUREMENT

The MWRA measured flows at 70 of 81 active CSO outfalls and at 22 interceptor metering locations, and used data from over 170 existing meter locations. Over 60 rainfall events of varying amounts, intensities and durations occurred during the April to November monitoring period allowing the MWRA to develop an extensive, high-quality site-specific data base.

The monitoring program showed that tide levels affect many CSO outfalls. For example, during the June 1 storm (with more than 2 inches of rain), the rising tide shut off many overflows, yet the system was able to contain the flow. The lack of flooding or back-up means that the sewer system has more potential to store flow than assumed by earlier planners, indicating the need to first make small changes — such as raising the heights of overflow walls (called weirs). This simulates tidxe action and could greatly decrease flows to receiving waters.

The MWRA also monitored water quality at 10 CSO locations. The study measured pollutant concentrations and estimated pollutant loadings for two storms. The results showed that pollutant concentrations are less than the levels assumed in the 1990 Facilities Plan. Decreased flow estimates coupled with lower pollutant concentrations means that lower loadings are entering receiving waters.

INSPECTION RESULTS

The MWRA completed extensive CSO outfall and regulator inspections within the four communities. These inspections aid in understanding exactly how the system works. This information and community data also allowed the MWRA to identify tidegate malfunctions, sediment accumulation or other problems that typically occur in large systems. Ongoing community efforts to maintain and improve systems will allow CSOs to operate efficiently, further reducing overflows.

USING THE 1992 DATA

The metering and inspection programs provided a great deal of information on each CSO site in the four communities. This data has been incorporated

THE RESULTS ARE IN

...AND 1992 DATA COLLECTION AND MODELING SHOW MAJOR CHANGES:

- CSO flows and loads are much lower than the levels that formed the basis for the 1990 Facilities Plan recommendations.
- CSO community and MWRA collection systems have more capacity to hold wet weather flows than earlier realized.
- System Optimization Plans — already being developed — will further reduce CSO flows and loads with low-cost system improvements.
- System improvements have brought more flows to the treatment plant and decreased CSO discharges. The opening of the new primary treatment plant, rehabilitation of the north system sewer and infiltration and inflow reduction programs will reduce CSOs even more.

June System Optimization Plans will detail more improvements to come. Watch this space for information.

Questions?

The Authority will continue to hold neighborhood meetings periodically throughout the project. If you have questions about the project, would like further information or would like to be added to the mailing list, please call Vincent Ragucci of the MWRA Public Affairs Department at 241-6057 x1191.

into a new sewer system computer model that allows the MWRA to learn even more about how the system works. The model can simulate rainfall of varying amounts to see how the system responds as well as show the effects of different system improvements or long-term CSO control measures.

Once the model was developed, the MWRA checked model predictions against actual flows measured during storms, which gave the Authority a great deal of confidence in the model's accuracy. The model will be used extensively as the MWRA evaluates the benefits of different system optimization measures for the June 1993 court milestone.

When comparisons were made between new model flow predictions and flow estimates used in 1990, current flows were significantly lower. Thus, significant downsizing or other modifications to the 1990 plan may be in order.

EXPLAINING THE DIFFERENCE

Why is there such a difference between 1990 Facilities Plan flow predictions and the results of the 1992 metering program? There are three major reasons for this difference:

First, the MWRA completed fast-track system improvements at the Deer Island treatment plant. Pumping capacity has been significantly increased, which means that more peak flows are reaching the plant rather than discharging into area waters.

Second, the CSO communities and the MWRA have instituted aggressive maintenance programs to reduce CSOs, and MWRA operation procedures have also been modified to meet that goal.

Third, in some communities large areas of separated stormwater flow are recombined with sanitary flows. The Authority plans to work with these communities to see if areas with separate sewers can be dealt with locally, with site-specific solutions, rather than by incorporation into long-term CSO control plans.

The results of the 1992 work clearly demonstrate that there have been reductions in CSO flow over the past several years. The challenge now is to use this information to develop the most appropriate, cost-effective solution to this problem.

EPA ISSUES DRAFT CSO CONTROL POLICY

In January, the Environmental Protection Agency issued a draft policy that provides an aggressive but reality-based framework for CSO control efforts.

The plan, which was carefully crafted with assistance from many municipalities, environmental groups and other organizations, promotes efforts the MWRA has already put into

(Continued on page 4)

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(EPA ISSUES DRAFT CSO CONTROL POLICY/ Continued from page 3)

place and calls for immediate implementation of nine minimum controls, including proper operation and maintenance, maximum collection system use for storage and a public review process. The policy also requires a thorough study of how the CSO system responds to different rainfall events. Once the study is completed, the information will be put to good use implementing measures to support long-term CSO control.

The draft policy also emphasizes better management practices before huge capital investments are made and takes each community's financial capability into account. The opportunity to phase in CSO solutions should allow the MWRA and the communities more time to assess the effects of each improvement, as well as spread out the costs of the project, reducing the impact on ratepayers.

During the 60-day public review period on the policy, the MWRA commented on the plan and encouraged input from communities, ratepayers and local environmental groups.

Executive Director Douglas B. MacDonald said that the Authority's program could become a national model for achieving environmental and public health goals in an affordable manner. "The Authority worked closely with the EPA to develop the new policy. We will continue that effort with the new Administration and Congress to obtain funding to finance the improvements necessary to end CSO pollution," MacDonald said.

WHAT'S NEXT?

The Interim CSO Report was submitted to EPA and the Conservation Law Foundation at the end of February. *(A copy of the report was distributed to libraries in the CSO communities.)*

While the report is being reviewed, the Authority is working with the four CSO communities to develop System Optimization Plans (SOP). SOPs are intended to maximize the amount of combined flow transported to treatment facilities and minimize CSO discharges by making relatively low-cost modifications to the existing system. These may include projects such as repairing tidegates, raising weir heights or increasing the size of connections between the community and MWRA systems. This report is due to EPA in June.

Future newsletters will bring you up to date on SOP activities.

COMING NEXT TIME...

- ***System Optimization Plans and how they work***
- ***Looking at the whole system — the value of master planning***

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CSO BULLETIN

A publication of the Massachusetts
Water Resources Authority's
Sewerage Division

Volume 2, Issue 3
Winter 1994-1995

Boston's Prison Point CSO treatment facility

MWRA releases draft CSO plan

The Massachusetts Water Resources Authority has released the draft of a $374 million long-term CSO control plan for Boston Harbor and its tributaries. The report contains strategies for controlling or eliminating pollution from combined sewer overflows and recommendations for addressing other system-wide wastewater management needs. The report suggests a 15 to 20 year implementation schedule for the CSO portion of the plan.

The plan, which was released on September 30, is the third phase of the Authority's effort to control area CSOs. The first phase of the program included facilities improvements that reduced annual CSO volume by 55 percent between 1988 and 1992. The second phase, which is ongoing, includes system optimization and other improvements that will reduce CSO volume by 70 percent over 1988 conditions. The elements of phase three – the new recommended plan – will result in an 84 percent reduction in CSO volume over 1988 conditions, with 94 percent of the flow receiving at least screening and disinfection.

The five-volume plan is available for public review at 20 libraries throughout the region (see list on page 5). The Authority has presented the plan at several community meetings and welcomes comments on all aspects

(CSO plan/Continued next page)

WHAT ARE CSOs?

The sewer systems in Boston, Chelsea, Cambridge and Somerville collect sanitary sewage from homes and businesses in the same pipes used to collect stormwater runoff. This is called a combined sewer system. During dry weather, when only sanitary sewage is entering the pipes, the system can handle the flow and transport it to Deer Island for treatment. In wet weather, the addition of stormwater overloads the system. At the same time, MWRA interceptors experience heavier flows due to inflow and infiltration from upstream communities. For these reasons, in wet weather the combined sewage and rainwater can back up and flow into the harbor and connecting rivers through 81 active combined sewer overflows (CSOs) in four communities. This flow contributes to the pollution of local waters, violating federal and state water-quality standards. Currently, about 50 percent of these flows receive some limited treatment before being discharged. These four cities are not alone with this problem. Over 1,000 U.S. communities have similar combined systems and resulting water-quality problems.

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SEPTEMBER 1993
SOP implementation plan completed

DECEMBER 1993
Baseline CSO-flows report submitted

MARCH 1994
Baseline water-quality analysis completed

JUNE 1994
Alternatives for CSO control completed

SEPTEMBER 1994
Draft plan for CSO control and draft System Master Plan

DECEMBER 1994
Final conceptual plan for CSOs and final System Master Plan

SPRING 1995
Begin CSO Facilities Plan/EIR revisions

(CSO plan/Continued from page 1)

of the CSO strategies and System Master Plan. Letters may be sent to: Lise Marx, MWRA, 100 First Ave., Building 39, Charlestown MA 02129.

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection and other federal court parties will also review the plan. Their comments will be included in a final plan to be issued in December 1994.

New plan versus the old

The conceptual CSO control plan takes an approach that differs markedly from the 1990 CSO Facilities Plan, which proposed a $1.3 billion deep-rock tunnel system to store CSO flows.

With one exception, the recommended plan involves separate CSO controls for 14 waterbodies that discharge into five receiving waters or basins: Dorchester Bay and Neponset River; Constitution Beach; Charles River; Alewife Brook and Mystic River; and Boston Harbor.

The exception is a screening and disinfection facility on Reserved Channel that would handle CSOs from both the Channel and from North Dorchester Bay, eliminating discharges near beach and swimming areas.

Controls proposed for the other receiving waters include interceptor relief, upgrading existing CSO-storage and treatment facilities, sewer separation and new screening and disinfection facilities. The plan supports changes proposed in the System Master Plan, including moderate infiltration and inflow (I/I)* reduction, interceptor relief projects and downsizing the Deer Island secondary treatment plant.

Looking at the details

The report contains detailed information on the planning approach, the alternatives for CSO control in each receiving water and recommendations that include cost, water quality impacts and site considerations. The chart on pages 3 and 4 summarizes the recommended projects, costs and benefits for the five basins. The plan focuses on controlling bacteria and floating pollution to increase swimming, shellfishing and recreational uses.

The plan will (1) eliminate CSO discharges to Dorchester Bay, the Neponset River estuary and Constitution Beach; (2) reduce untreated overflows in other receiving waters to an average of one to four times per year (currently, CSOs discharge up to 80 times a year); and (3) upgrade CSO treatment facilities at Cottage Farm, Prison Point and Somerville Marginal. CSO facilities at Commercial Point, Fox Point and Constitution Beach would be decommissioned or potentially turned over to others for use in stormwater treatment.

Approaching the problem

The MWRA is using a watershed planning approach that takes into account both CSO and non-CSO sources of pollution that degrade water quality in each basin. Non-CSO sources include urban and agricultural runoff, drainage from highway and transportation facilities and construction sites.

The MWRA chose this approach because CSO drainage often

(CSO plan/Continued next page)

* Infiltration is water that enters the system through leaky pipes, joints, connections and manholes. Inflow is water that enters the system from roof leaders, drains and sump pumps, catch basins and swampy areas.

contributes small amounts of flow compared to flow contributed by stormwater and upstream sources. In these cases, ending CSO discharges would not mean attaining water quality standards. Consequently, in addition to controlling and reducing CSO flow, the plan suggests identifying the remaining sources of pollution for removal, then reassessing resulting water quality.

System Master Plan recommendations

In addition to CSO control, the System Master Plan evaluates other wastewater conveyance and treatment components, including infiltration and inflow (I/I), interceptor relief and secondary treatment plant capacity. The plan's recommendations represent an integration of these areas in order to assess the impacts of each strategy on the others and to propose an overall cost-effective program for addressing a range of wastewater management needs. Several conclusions are documented in the report, including:

- A moderate overall level of I/I control will result from community infrastructure improvements and maintenance programs.
- Improvements to interceptors are recommended. Interceptors are pipes that collect and transport flows from community systems to the treatment plant. The plan suggests 15 interceptor relief projects, two of which are already in facilities planning. The estimated capital cost for the 13 other projects is $35 million. Design and construction would be scheduled to address the worst conditions first.
- The Deer Island plant requires a secondary treatment capacity of two and two-thirds to three batteries as a result of system improvements that have reduced flows and loads. The needed capacity could save at least $165 million in capital construction costs from the original four-battery plan. This reduction would not sacrifice environmental quality in Boston Harbor and would still enable the plant to meet primary and secondary treatment requirements. Secondary capacity reassessment is being finalized as part of another MWRA study. Preliminary recommendations will be available in late fall.

Overall CSO control program

As the MWRA completed the CSO control plan and System Master Plan, other system improvements were underway, including capital projects and changes in operations that ended dry-weather overflows, eliminated some CSOs and reduced flow from remaining outfalls.

In addition, the MWRA is working with Cambridge, Chelsea, Somerville and the Boston Water and Sewer Commission to implement System Optimization Plans at 139 locations at a cost of about $4 million. These low-cost projects should bring substantial benefits in the near future, reducing flow by 10.9 million gallons in a three-month design storm (roughly four times a year).

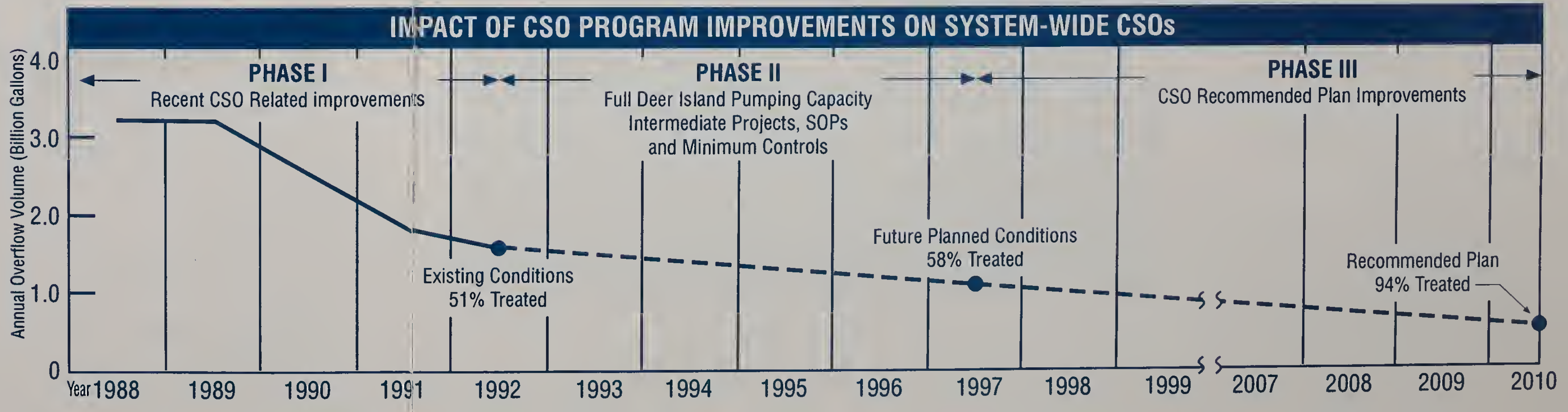
Improvements to the North Main Pump Station on Deer Island will allow more flow to reach the treatment plant. Finally, nine minimum CSO controls recommended by the EPA – ranging from proper

(CSO plan/Continued next page)

TABLE 3-6 RECOMMENDED CONCEPTUAL CSO CONTROL PLAN
Critical Uses in Parenthesis

Basins	Level of Control	Recommended Plan	Annual CSO Activation Frequency				Reasons/Comments	Capital Cost (million $) (2)
			Fut. Planned Conds.		Recommended Plan			
			Total	Untreated	Total	Untreated		
Dorchester Bay								
N. Dorchester Bay (Swimming/Shellfishing)	I	CSO relocation to Reserved Channel	78	78	0	0	1. Eliminates CSOs to North Dorchester Bay, potential for SA deignation 2. Relocated flow to Reserved Channel to receive screening and disinfection	$79
S. Dorchester Bay (Swimming/Shellfishing)	I	Sewer separation	22	1	0	0	1. Eliminates CSOs, potential for SA designation 2. Interim upgrade of existing facilities	$95
Neponset River (Shellfishing)	I	Sewer separation	17	17	0	0	1. Eliminates CSOs 2. Requires separation of South Dorchester area also	$11
							Subtotal—Neponset River/Dorchester Bay Subarea	$185
Constitution Beach								
(Swimming/Shellfishing)	I	Sewer separation	16	0	0	0	1. Eliminates CSOs, potential for SA designation 2. Critical use area	$9
							Subtotal — Constitution Beach Subarea	$9
Charles River								
Upper Charles River	II	Screening and disinfection at individual CSOs in Boston and Cambridge (BOS032, CAM005, 009)	10	10	11	0	1. High recreational uses; heavy stormwater impact on Charles River 2. Reconsider after watershed planning, separation cost of $80 million	$5
Lower Charles River —Cottage Farm	II	Upgrade of Cottage Farm CSO Facility with Finer screens, effluent diffuser, upgrade chlorination, provide dechlorination	22	0	21	0	1. High recreational use: heavy stormwater impact on Charles River	$7
—Stony Brook	II	Screening and disinfection of Stony Brook flows	30	30	26	0	1. Heavy stormwater impacts on Charles River 2. Treats stormwater and CSO from Stony Brook basin 3. Reconsider after watershed planning with state	$24
Back Bay Fens	II	Screening at outfall	2	2	2	2	1. Consistent with water quality goal	
							Subtotal — Charles River Subarea	$36
Alewife/Upper Mystic								
Alewife Brook	II	Separate CAM004 Area	16	16	9	9	1. 4-7 overflows per year, large stormwater impacts 2. Reevaluate in conjunction with watershed planning by state	$3
Upper Mystic River	II	Separation of baffle manholes Continued treatment at Somerville Marginal CSO Facility (SOM007A)	11	2	3	0	1. Large stormwater impacts 2. No water quality benefit for higher controls	$0.1
							Subtotal — Alewife/Upper Mystic Subarea	$3
Boston Harbor								
Upper Inner Harbor	II	Relieve E. Boston Branch Sewer, Upgrade existing Prison Point CSO Facility (dechlorination), Near-surface storage for Charlestown B0S019	36	36	25	5	1. 4-7 overflows per year from E. Boston and BOS 019 industrial/shipping water uses 2. Allows full use of Caruso Pump Station capacity 3. Large impacts from stormwater and Charles R. discharge	$22
Lower Inner Harbor	II	Relieve E. Boston Branch Sewer	29	29	5	5	1. 4-7 overflows per year from E. Boston	$20
Mystic Chelsea	II	Screening/disinfection facilties at BOS014, 017, CHE008, Storage at relocated Somerville Marg. CSO Facility, Interceptor relief CHE002—CHE004	35	35	14	9	1. Industrial/shipping water uses and Mystic R. discharge impacts 2. Dissolved oxygen deficient near existing Som. Marginal facility outfall	$32
Reserved Channel	II	Regional screening/disinfection facility (Joint with N. Dorchester Bay)	44	44	6	6	1. High commercial/industrial use 2. Receives relocated CSO from N. Dorchester Bay	$41
Fort Point Channel	II	Disinfection treatment facility in Union Park P.S., Consolidation storage at BOS072/073 Coarse screens at BOS050 to BOS068 In—line storage in Dorchester Brook conduit	23	23	12	7	1. Separation infeasible: aesthetics important 2. High commercial/industrial use	$25
							Subtotal — Boston Harbor Subareas	$141
							Total — All Subareas:	$374

(1) For receiving water segments with multiple CSO outfalls, activation frequency is for the most active outfall tributary to the receiving water segment.
(2) Capital cost includes engineering, construction and contingency.


IMPACT OF CSO PROGRAM IMPROVEMENTS ON SYSTEM-WIDE CSOs

operations and maintenance to inspection and pollution prevention – are being implemented by the MWRA and the CSO communities.

The long-term CSO program was devised under a new national CSO control policy that gives communities more guidelines for controlling wet-weather pollution, offers more flexible alternatives and considers costs and affordability. It has also benefited from comments and suggestions made by the public, representatives of state and federal agencies, the MWRA Advisory Board and the Wastewater Advisory Committee. The MWRA looks forward to responding to the comments it receives on the Draft CSO Conceptual System Master Plans.

Because planning on a watershed basis is the most effective way to improve water quality, the MWRA will support state and federal agencies and environmental and municipal officials as they develop and implement watershed planning throughout the region. A future *CSO Bulletin* will detail these efforts.

Implementing the plan

Once the CSO and System Master Plans have been finalized, the MWRA will initiate negotiations with the Environmental Protection Agency on an overall project schedule. The current plan will be affected by comments received by reviewers and the public; discussions with the Court parties, the CSO communities, and others; further internal review; and reviews by regulatory agencies.

Most of the projects will go through Facilities Planning (FP) and Environmental Review (EIR) processes, as well as a review of water quality impacts. It is expected that some CSO control

(CSO plan/Continued last page)

CSO AND MASTER PLANNING LIBRARY REPOSITORIES

Reports and draft and final plans for CSOs and the System Master Plan will be available in the reference departments of the following libraries between now and the end of the year. If you have any questions, or are unable to find a document of interest, please call Lise Marx, MWRA CSO Program at (617) 242-0230.

BOSTON PUBLIC LIBRARY
Copley Square
Boston MA 02117

BOSTON PUBLIC LIBRARY
SOUTH BOSTON BRANCH
646 E. Broadway
South Boston MA 02127

BOSTON PUBLIC LIBRARY
ADAMS BRANCH
6990 Adams St.
Dorchester MA 02122

BOSTON PUBLIC LIBRARY
WASHINGTON VILLAGE
1226 Columbia Rd.
South Boston MA 02125

BOSTON PUBLIC LIBRARY
EAST BOSTON BRANCH
276 Meridian St.
East Boston MA 02128

BOSTON PUBLIC LIBRARY
ORIENT HEIGHTS BRANCH
18 Barnes Ave.
East Boston MA 02128

BOSTON PUBLIC LIBRARY
CODMAN SQUARE BRANCH
690 Washington St.
Dorchester MA 02124

BROOKLINE PUBLIC LIBRARY
361 Washington St.
Brookline MA 02146

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449 Broadway
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CHELSEA PUBLIC LIBRARY
569 Broadway
Chelsea MA 02150

MWRA LIBRARY
100 First Ave.
Charlestown MA 02129

METROPOLITAN AREA
PLANNING COUNCIL
60 Temple St.
Boston MA 02111

NEEDHAM PUBLIC LIBRARY
1139 Highland Ave.
Needham MA 02192

QUINCY PUBLIC LIBRARY
40 Washington St.
Quincy MA 02169

READING PUBLIC LIBRARY
64 Middlesex Ave.
Reading MA 01867

REVERE PUBLIC LIBRARY
179 Beach St.
Revere MA 02151

ROBBINS PUBLIC LIBRARY
700 Massachusetts Ave.
Arlington MA 02174

SOMERVILLE PUBLIC LIBRARY
79 Highland Ave.
Somerville MA 02143

STATE HOUSE LIBRARY
The State House
Boston MA 02133

WELLESLEY PUBLIC LIBRARY
530 Washington St.
Wellesley, MA 02181

Photo by Karen-Jayne Dodge

QUESTIONS?

The Authority invites comments on the Draft CSO Conceptual Plan and System Master Plan. Please mail your letters to Lise Marx, MWRA CSO Program, 100 First Ave., Charlestown MA 02129. If you have questions about the project, would like further information or would like to be added to the mailing list, please call Vincent Ragucci of the MWRA Public Affairs Department at 241-6057 ext. 1191, or Lise Marx, CSO Program, at 242-0230.

(CSO plan/Continued from page 5)

projects will proceed directly to design after water quality reviews have been completed since they involve upgrading or repairing an existing facility (for example, adding dechlorination to a screening and chlorination facility). New projects will be subject to all facilities planning aspects, including site assessments, geotechnical and hazardous materials evaluations, natural and cultural resource assessments and updated cost estimates and implementation schedules.

While Facilities Planning is underway, the MWRA will submit applications for partial use designations to the Department of Environmental Protection for waterbodies that will still receive CSO discharges after the plan is implemented. The state's CSO policy allows these exceptions where certain conditions exist, for example, where removing CSOs would cause adverse economic and social impacts or fail to meet water quality standards due to non-CSO sources of pollution.

Public participation will be an essential part of facilities planning and any requests for partial-use designation. As Facilities Planning is initiated in early 1995, the MWRA will continue its regular community briefings. Watch ***CSO Bulletin*** for meeting notices.

Coming next time...

- ***Description of the final CSO and SMP plans***
- ***Implementation update***
- ***A look at watershed planning***

Printed on recycled paper.

CSO BULLETIN

A publication of the Massachusetts Water Resources Authority' Sewerage Division

Volume 2, Issue 3
Winter 1994-1995

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CSO BULLETIN

A publication of the Massachusetts Water Resources Authority's Sewerage Division

Volume 3, Issue 2
Fall 1995

All Boston Harbor visitors anticipate continued improvements in harbor waters, including the Inner Harbor where the MWRA will construct new CSO control facilities.

MEPA review of CSO Plan moves forward

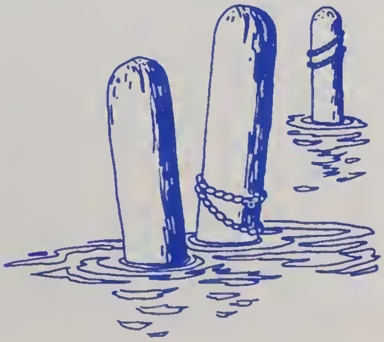
The Massachusetts Environmental Policy Act (MEPA) Unit has issued important decisions on the Massachusetts Water Resources Authority's CSO Plan. The decisions will allow the MWRA to begin construction of some CSO projects and environmental review of others. (MEPA is a state agency that facilitates the formal public review of environmental impacts and proposed mitigation measures associated with projects.)

MEPA's Final Record of Decision, issued on July 14, allows the MWRA to proceed on several projects without additional review. These Phase I projects include sewer separation work in East Boston, South Dorchester, Cambridge and Somerville; upgrades to existing MWRA CSO screening and disinfection facilities at Cottage Farm, Prison Point, Somerville-Marginal, Commercial Point and Fox Point; region-wide floatables control; in-line storage in the existing Dorchester Brook Conduit; outfall repairs at a Chelsea outfall; and a small-scale interceptor connector project along the Charles River in Boston.

(CSO plans/Continued next page)

TECHNICAL ADVISORY COMMITTEE (TAC)

Secretary of Environmental Affairs Trudy Coxe recently appointed members of a Technical Advisory Committee (TAC) to advise her on the CSO project. The group includes residents of Boston, Cambridge, Somerville and Chelsea; wastewater professionals; local and DPW officials; and members of conservation, business and environmental organizations. The TAC will meet approximately monthly to review proposed plans for the project, including siting and other technical reports.



CHRONOLOGY

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U.S. District Court orders MWRA to develop a CSO Facilities Plan

SEPTEMBER 1990
MWRA submits CSO Facilities Plan to court. Plan recommends a regional tunnel system

JANUARY 1992
MWRA and EPA negotiate a short-term schedule for data collection and development of System Optimization Plans

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Interim CSO report submitted to EPA/CLF showing the need for reevaluating the regional tunnel system

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System Optimization Plans (SOP) for the four CSO communities are submitted to EPA

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CSO control alternatives identified

DECEMBER 1994
Final CSO Conceptual Plan and System Master Plan completed

APRIL 1995
Environmental Notification Form filed for recommended CSO projects; commenced CSO Facilities Plan/EIR

JULY 1995
MEPA issued both the Final Record of Decision allowing 15 projects to go to design and the Certificate on the scope of work for the Draft Environmental Impact Report

(CSO plans/Continued from page 1)

Before implementing Phase 1 projects, the MWRA must submit draft construction-mitigation guidelines to MEPA for review by municipalities and the general public. Construction contractors working on these projects will be required to comply with the final mitigation measures. The MWRA expects to submit these guidelines to MEPA later this fall.

The Secretary's Certificate on the Environmental Notification Form, issued to the MWRA on July 14, contains a scope of issues to be addressed in both the Interim Assessment of Facility Siting (siting document) and the Draft Environmental Impact Report (DEIR). The siting document will be submitted to MEPA this December and will identify alternative facility sites and conduit alignments for the remaining projects (excluding most Phase 1 projects), evaluate potential sites and define preferred preliminary locations.

Public review of the siting document and proposed siting criteria will take place at neighborhood meetings scheduled for the fall. (See page 4 schedule.)

While the siting document will contain preliminary siting information, the DEIR will contain a more detailed and comprehensive analysis of the projects and site options and will identify the MWRA's preferred plan. The MWRA must consider a number of factors in these evaluations, including – but not limited to – natural features of the site (such as topography and wetlands), air quality, traffic, land use, historical resources and institutional issues. The MWRA will also analyze the impacts of the entire CSO Plan, including the water quality benefits to be achieved by the plan. The Authority plans to submit the DEIR to MEPA in October 1996.

CSO project siting evaluations underway

The MWRA is in the process of identifying potential sites and conduit routes for 16 of the recommended CSO projects. Siting involves sequential investigations and evaluations that will culminate in a report on preferred site options this December. The projects, as described in the December 1994 CSO Conceptual Plan and System Master Plan, include:

- **Soft Ground Tunnel Projects**
  North Dorchester Bay CSO Relocation Conduit
  Reserved Channel Consolidation Conduit
  Fort Point Channel Storage Conduit
- **Screening and Disinfection Facility Projects**
  Reserved Channel Screening and Disinfection Facility
  Stony Brook Conduit Screening and Disinfection Facility
  Upper Charles River Screening and Disinfection Facility
  Charlestown Screening and Disinfection Facility
  Mystic/Chelsea Confluence Screening and Disinfection Facility
- **Pipeline Relief Projects**
  Charles River Interceptor Connection
  East Boston Branch Sewer
  Chelsea Local Trunk Sewer
  Chelsea Branch Sewer
- **Detention/Treatment Facility for Union Park Pump Station Flows**
- **Dorchester Brook Conduit In-System Storage Facility**
- **Outfall Improvement Projects**
  Chelsea (CHE008) Outfall
  Cottage Farm CSO Facility Outfall

Evaluations/Continued next page)

The MWRA's first step in the siting process is to define study-area boundaries for each project. These boundaries represent the maximum area within which a project could feasibly be developed. The MWRA will base the boundaries on engineering criteria, such as the locations of existing pipes, regulators and outfalls, and on additional costs incurred for constructing a project at any distance away from the theoretically lowest cost location.

The next step will be to identify potential sites and routes within study area boundaries. Technical criteria will be used to estimate the area requirements for construction and operation of the projects, including building or shaft footprint, as well as staging area, access and parking needs. Potential sites include areas of open or vacant land, abandoned lots and developed lots with a predominance of open space. The MWRA will then investigate parcel ownership through assessors' maps and records.

The next stage of the siting process involves evaluating environmental and economic impacts and potential institutional or neighborhood conflicts. The MWRA is investigating these issues and other factors through field work during the summer and fall. This work will characterize natural resources, identify sensitive land uses, evaluate traffic and site access issues and determine if competing development plans exist. The Authority will then develop a rating criteria and methodology to assess potential sites and determine preferred site options.

Preferred sites will undergo more extensive reviews to assess potential environmental or community impacts during Draft EIR preparation, or as part of several environmental permitting processes. This fall, the MWRA will conduct community meetings to explain the siting process and discuss any specific local issues.

Implementation plan and schedule

Under the Final CSO Conceptual Plan – approved by the MWRA Board of Directors last December – some of the 28 recommended CSO projects will be implemented by the MWRA and others by the CSO communities.

The MWRA's responsibilities will include facilities planning and environmental assessment of all projects, as well as design and construction of projects that will result in MWRA-owned facilities. Examples of facilities that will be MWRA owned include upgraded or new CSO treatment facilities, MWRA interceptor relief projects and new CSO storage facilities.

Community implementation responsibilities will include the permitting, design and construction of projects resulting in community-owned facilities. Examples include sewer separation projects and floatables controls on community-owned CSO outfalls. The MWRA will design and construct all CSO projects in Chelsea, although some projects will result in new city-owned, operated and maintained facilities.

Under the proposed plan, projects accounting for roughly $130 million of the total $370 million plan will be implemented by local communities.

(Implementation/Continued next page)

The MWRA's CSO Plan will improve water quality in Boston's busy Inner Harbor. The Authority's new Deer Island treatment plant is under construction in the background.

Capital costs for planning, design and construction of the CSO projects, including the projects that will be implemented by the communities, will be funded by the MWRA, within its Capital Improvement Program (CIP).

The MWRA is presently developing appropriate financial assistance agreements with the CSO communities. Somerville's projects, which are less complicated and less costly, will likely move on a faster track, under the MWRA's existing System Optimization Plan (SOP) agreement. Generally, each agreement will be structured to meet the following objectives:

- Establish a working relationship between the MWRA and the community that reflects their shared responsibility for CSO control in accordance with federal and state policies.
- Facilitate the completion of all community-implemented projects in accordance with the MWRA CSO Conceptual Plan.
- Facilitate the completion of MWRA-implemented CSO projects with support from the community and with ample opportunity for review and input by the community.
- Establish project schedules.
- Provide MWRA funding of capital costs.
- Define ownership, operation and maintenance responsibilities.

The most important goal to be reflected in the agreements is the full realization of water quality benefits from the recommended projects in a time frame that complies with the MWRA's anticipated federal court schedule.

Discussions between the MWRA and the CSO communities are ongoing and the agreements are expected to be completed and executed by the end of 1995. Meanwhile, projects are moving ahead. Facilities planning and the environmental review of the larger projects are well underway and will be completed in June 1997, and the design of those projects will begin soon after. Construction of the Somerville baffle manhole separation projects will begin this fall under the SOP agreement. These projects, which will eliminate some CSO discharges to the Alewife Brook and the Mystic River, are scheduled to be completed by June 1996. Also, the Boston Water and Sewer Commission has begun design of some of the recommended sewer separation projects, under its SOP agreement with the MWRA.

The MWRA, EPA and the other parties to the Boston Harbor case are progressing towards agreement on potential federal court schedule milestones for completing CSO projects. New milestones are expected to be jointly proposed to the federal court judge this fall. A draft schedule, which generally follows the schedule proposed by the MWRA in its Final CSO Conceptual Plan, calls for commencement of design and construction of some of the projects as early as 1995 and 1996, with all projects completed by 2010.

COMMUNITY MEETING SCHEDULE

Meetings on CSO Control Project environmental reviews will begin in October. The meetings will focus on controls proposed for each geographic area. Over the next several months, the MWRA will begin to identify and evaluate potential facility and pipe locations. At community meetings, the MWRA will present information on siting needs and criteria, and – as engineering progresses – on more detailed facility location and design aspects. There will be opportunities to ask questions and raise issues of neighborhood concern. The MWRA will work closely with community groups over the next two years to ensure that feasible projects can be implemented while minimizing neighborhood impacts.

CHELSEA
October 5, 7:00 PM
Chelsea City Hall,
City Council Chambers

CAMBRIDGE
Oct. 11, 7:00 PM
Cambridge City Hall,
Ackermann Rm.

STONY BROOK
October 18, 7:00 PM
Tobin Community Center
1481 Tremont St., Boston

UNION PARK
October 30, 6:30PM
Boston Ballet
19 Clarendon St., Boston

For information on fall neighborhood meetings in Charlestown, East Boston and in the South Boston/Reserved Channel area, please call Vincent Ragucci at 241-6057.

Looking at the watersheds - II

This is the second in a series of three ***CSO Bulletin*** *articles on watersheds. See Spring 1995 for the first article. The final article will appear in a future issue of the* ***CSO Bulletin****.*

MWRA developed its CSO control plan by using specific information on CSO discharges, existing water quality and receiving water uses. The five larger basins were divided into 14 segments for this analysis. The Spring 1995 ***CSO Bulletin*** looked at three of the five watersheds in the CSO control plan: Dorchester Bay / Neponset River; Constitution Beach / Alewife Brook and the Mystic River. This issue focuses on the Inner Harbor, which includes Chelsea Creek, Charlestown, downtown Boston and Fort Point Channel. The Charles River will be highlighted in the next issue. For additional information on watersheds, call MWRA Public Affairs at 241-6057 for a copy of the 1994 State of the Harbor report.

Inner harbor overflows will decrease to about four a year, or be treated, as a part of the CSO plan.

The Inner Harbor

The **Upper Inner Harbor** includes the waters between downtown Boston, Charlestown and East Boston and the Charles River below the Charles River dam. The harbor here offers a deep channel for commercial activities. Fresh water from two rivers (the Charles and Mystic) mixes with seawater, creating a salt-stratified region.

Ten CSOs discharge into the **Upper Inner Harbor**, including the Prison Point CSO Facility, which treats its discharge. The CSO plan includes a range of technologies to improve water quality in this watershed:

- Upgrading the Prison Point treatment facility to include dechlorination to lower toxicity in the receiving water;
- Building a new screening and disinfection facility at BOS019 in the Charlestown Navy Yard area;
- Constructing new interceptor sewers in East Boston to reduce overflows at outfalls along the waterfront to increase the capacity of the East Boston Branch Sewer;
- Installing floatables controls at outfalls in the Inner Harbor around the Boston and East Boston waterfronts. These outfalls are relatively inactive.

Once the MWRA completes this work – estimated to cost $23 million – untreated overflows will decrease from 36 events to approximately four per year.

The **Lower Inner Harbor** receiving water basin lies between South Boston and East Boston near Logan Airport. It includes two shipping channels for the Port of Boston and the Third Harbor Tunnel, now under construction. There are no critical uses for this area and no current shellfishing.

Five untreated CSOs discharge to the Lower Inner Harbor. The plan calls for interceptor relief to increase the capacity of the East Boston Branch Sewer and floatables controls for all East Boston CSOs. This solution will eliminate three-month storm overflows at the outfalls and help to alleviate local flooding in East Boston. Overflows will decrease from 29 events to approximately four per year at a capital cost of $20 million.

For the **Chelsea Creek** portion of the Mystic River / Chelsea Creek confluence, CSOs will be controlled by replacing the undersized local sewers that drain to three Chelsea outfalls and replacing or constructing a parallel pipe for approximately 8,500 feet of the Chelsea Branch Sewer. Floatables controls will also be installed at all overflows and one Chelsea outfall may require structural repairs. The overflows from East Boston Chelsea Creek will be controlled by work done to increase the capacity of the East Boston Branch Sewer. Untreated overflows will decrease from eight events per year to four or fewer events at an estimated capital cost of $8 million.

Fort Point Channel is a narrow, shallow bay off the upper part of the Inner Harbor that separates South

(Watersheds/Continued last page)

Photos by Karen-Jayne Dodge

QUESTIONS?

The Authority invites comments on all aspects of the CSO Program. Please mail your letters or changes of address to Lise Marx, MWRA CSO Program, 100 First Ave., Charlestown MA 02129. If you have questions about the project or need any further information or would like to be added to the mailing list, please call Lise Marx at 242-0230 or Vincent Ragucci, MWRA Public Affairs Department at 241-6057.

*(**Watersheds**/Continued from page 5)*

Boston from downtown. No shellfish resources or designated critical uses have been identified for this channel. Recreational uses of the channel include fishing from the wharves and bridges and boating.

Seven untreated CSOs discharge into Fort Point Channel, including a large outlet at the upstream end that is the terminus of the Roxbury Canal and Dorchester Brook conduits (a large combined sewer tributary area). The main source of combined sewage is from the Union Park Pump Station.

The plan calls for a mix of solutions for Fort Point Channel, including:

- Constructing a detention and treatment facility for Union Park Pump Station overflows;
- Installing floatables controls in outfalls;
- Constructing a hydraulic gate and pump-out facility in the Dorchester Brook conduit to return captured overflows to the New Boston Main Interceptor after a storm; and
- Constructing a consolidation conduit to capture three-month storm overflows between two outfalls, with screens for solids control and a pump-out station to return stored flows to the South Boston Interceptor North Branch.

These proposed relief facilities, estimated at $26 million, will substantially improve aesthetics and decrease overflows from 74 untreated events annually to four untreated and 15 treated events.

Coming next time...

- ***A look at the Charles River***
- ***Update on siting evaluation***

Printed on recycled paper.

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Volume 3, Issue 2
Fall 1995

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CSO BULLETIN

A publication of the Massachusetts Water Resources Authority's Sewerage Division

Volume 4, Issue 1
Winter 1996

This Charlestown location near the Mystic/Tobin Bridge is one of the many sites evaluated in MWRA's siting report.

Report identifies neighborhood site options

MWRA has completed its Interim Assessment of Facility Siting report for the CSO Control Plan. The report presents the methodology used to identify and evaluate potential sites for 16 CSO projects and recommends more extensive evaluation of short-listed siting options. The report was submitted to the Massachusetts Environmental Policy Act (MEPA) Unit in December 1995 for public review and comment in January and early February.

The report identifies short-listed sites for the CSO projects listed below. The feasibility of using each site will be evaluated in more detail in the Draft Environmental Impact Report (DEIR), which is scheduled to be completed by October 1996. Projects are proposed in the following neighborhoods:

- *Chelsea:* A pipeline relief project for a local trunk sewer is proposed, along with relief of the larger MWRA Chelsea Branch interceptor. Outfall improvements may also be necessary at one outfall location – Chelsea Creek near Willoughby Street.
- *Cambridge:* A screening / disinfection facility is required to treat a Cambridge CSO in the Upper Charles River Basin. Improvements to the existing Cottage Farm CSO treatment facility outfall are also required.

(Neighborhood sites/Continued next page)

COMMUNITY MEETINGS

The next round of community meetings will take place during the comment period for the Interim Assessment of Facility Siting Report, which will be available in area libraries by the second week in January. The following meetings have already been scheduled:

CHELSEA
Jan. 16, 7:00 PM
Chelsea City Hall,
City Council Chambers

STONY BROOK/
MISSION HILL
Jan. 18, 7:00 PM
Tobin Community Center
1481 Tremont St., Boston

CAMBRIDGE
Jan. 23, 7:00 PM
Cambridge City Hall,
Ackermann Room

For information on other meetings, please call MWRA Community Relations Coordinator Vincent Ragucci at 241-6057. MWRA will send a summary notice listing all meetings to the CSO mailing list in December.

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(Neighborhood sites/Continued from page 1)

- ***Roxbury/Mission Hill:*** A screening / disinfection facility is necessary to treat wet weather flows in the Stony Brook conduit, which discharges to the Lower Charles River.
- ***Union Park:*** A detention tank capable of holding approximately 2.2 million gallons is proposed to store and treat wet weather flows from the existing Union Park Pump Station.
- ***East Boston:*** An interceptor pipe relief project is proposed for the MWRA East Boston Branch Sewer. This could include replacement of small or damaged pipe sections and / or construction of parallel pipe where necessary.
- ***Charlestown:*** Construction of two CSO screening and disinfection facilities is proposed to treat discharges into the Mystic River and Little Mystic Channel.
- ***South Boston/Reserved Channel Area:*** Soft-ground tunnel consolidation conduits are proposed along the southern side of the Reserved Channel and along Dorchester Bay beaches. Both conduits will lead to a proposed screening / disinfection facility to be located near Reserved Channel. This project will eliminate discharges to South Boston beaches.
- ***Fort Point Channel:*** A storage / consolidation conduit and pump-out station is proposed along Ft. Point Channel to hold wet weather flows.
- ***Brighton:*** An interceptor pipe relief project is proposed for the Charles River Valley Sewer to reduce the annual activation frequency of CSO discharges to approximately four times per year.
- ***South Bay:*** Installation of a hydraulic gate, a pump-out station, and piping modifications at the downstream end of the Dorchester Brook Conduit will hold wet weather flows and prevent upstream flooding.

The report contains a section on each project, with a map highlighting the study area and short-listed sites for each facility or pipeline route.

MWRA used the site screening and selection process to identify a reasonable number of site or route options. Siting and construction-staging requirements vary depending on the type of CSO project under consideration.

MWRA selected its preferred sites based on a process that included several sequential steps:

- Definition of study area boundaries for each project to show the maximum area in which the project could be located.
- Identification of the maximum number of potential sites and routes within the study areas.
- Documentation of natural resources, land uses, sensitive receptors, historical and archaeological resources, traffic and access and development conflict.
- Development of site-rating criteria for engineering, environmental, community, and economic concerns to evaluate and identify the most favorable sites.

While sites have been short-listed in the report, no site has been eliminated from the initial list of potential sites for each project. Sites that were not short-listed will be held in reserve and considered for future evaluation if needed.

In January and February, MWRA will conduct community meetings during the MEPA public comment period to discuss the siting process and any concerns with residents and local officials (see *Community Meetings*, pg. 1 for dates, times and locations). MWRA believes that public input is important early in the process for consideration when drafting the EIR.

For a copy of the report on Interim Assessment of Facility Siting, please call Janet Rompala, CSO Program, at 242-0230.

Assessing best management practices

As part of its CSO facilities planning activities, MWRA is assessing "best management practices" in cooperation with CSO community officials. Best management practices, or BMPs, typically are operational strategies or standards to control the quantity or quality of combined sewer discharges to receiving waters. (These are distinguished from "end-of-pipe" controls and typically focus on the source of the flow or pollutant.) BMPs may include such activities as street sweeping, catch basin cleaning and various types of runoff control.

MWRA previously studied BMPs as part of its 1990 CSO facilities plan. The study evaluated the relative merits of several BMPs and concluded that in-system storage was most cost-effective. In-system storage was evaluated in more detail as part of the Authority's 1994 System Optimization Program (SOP). Approximately 150 site-specific SOP projects were recommended and are currently being implemented in CSO communities with MWRA-provided funds. SOP projects are relatively low-cost structural changes that can be constructed in a short amount of time (such as raising weir heights within existing pipes). Implementation of these projects alone is predicted to decrease untreated CSO discharges up to 20 percent.

An interim BMP status report, completed in September 1995, summarized the existing community programs, defined the range of potential BMPs and described the screening criteria to be used in evaluating BMPs.

Since Boston, Cambridge, Somerville and Chelsea have already implemented some BMPs, one of the first steps is to review the effectiveness of existing community programs. Additional BMPs will also be presented for community consideration. Because the CSO communities will be primarily responsible for implementing BMPs, they are key participants in developing recommendations for any new control measures.

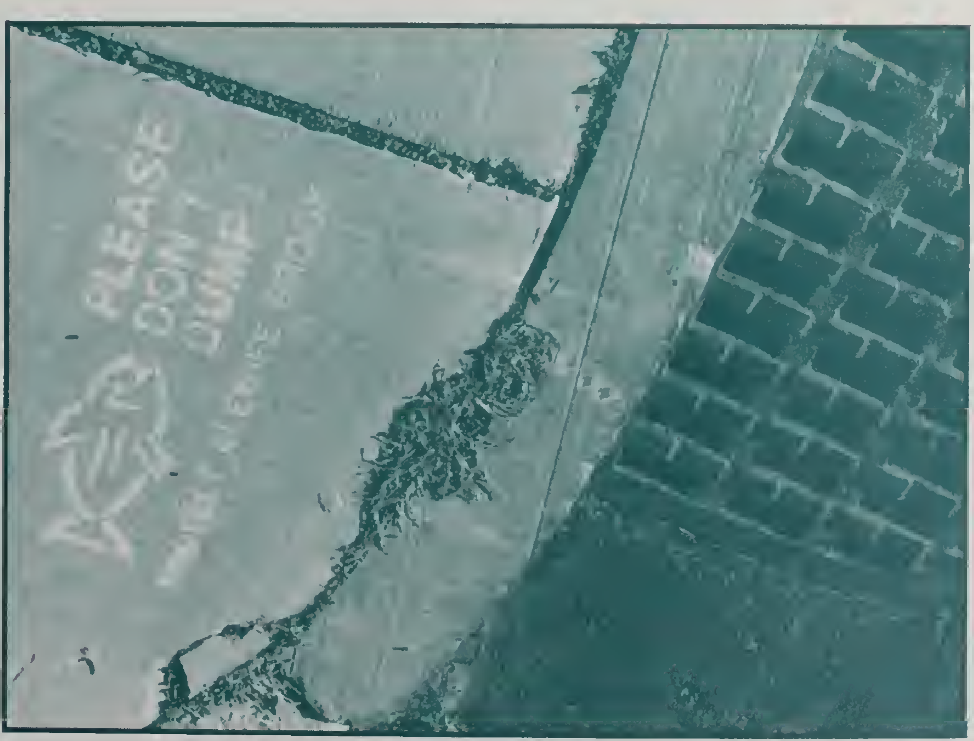
Many BMPs are intended to reduce the level of pollutants and / or flow from the stormwater portion of combined sewage flows. By implementing BMPs, communities can reduce the frequency and volume of CSO overflows and the quality of the overflows that do occur can be improved.

For the interim study, the BMPs were classified into four major categories:

- Regulatory controls – land use regulations, runoff and erosion control regulations, land acquisition;
- Source controls – cross-connection removal, street sweeping, catch basin cleaning, reduced road salting, industrial / commercial site control, pollution prevention;
- Public education – household hazardous waste programs, litter control, catch basin labeling, pet waste disposal; and
- Structural controls – stormwater diversion, roof leader connection removal, infiltration and detention basins, porous pavement.

In selecting BMPs, MWRA is emphasizing:

(BMPs/Continued next page)



"Please don't dump. Protect Alewife Brook." Labeling catch basins is one way of controlling pollution at its source.

MWRA completes engineering evaluations

As part of the current CSO Facilities Planning, special studies of technologies to control or treat CSO flows were completed in December 1995. The studies include evaluations to help projects move to the next appropriate phase – immediate construction, detailed design, and/or facilities planning. The following evaluations were performed:

- **Evaluating alternative disinfection technologies**. As part of its evaluation, the Authority conducted investigations of emerging technologies such as ultraviolet (UV) disinfection. The advantage of UV disinfection is that it is effective without the need to chlorinate and dechlorinate CSO discharges. The study results will allow new treatment facilities to proceed to facilities planning and existing facilities to proceed to design.
- **Investigating options for floatables control at CSO treatment facilities and at otherwise untreated CSO outfalls.** Floatables control options include in-line and off-line facilities, such as screens and netting, and receiving water controls, such as skimmer boats. The Authority conducted a literature review and field inspections of existing control options used in other cities. In addition, the Authority is conducting pilot studies on a new floatables-control technology for underflow baffles through Spring 1996. The findings will help the Authority formulate proposals for constructing floatables-control technologies at approximately 30 outfall locations.
- **Developing and evaluating alternatives for sewer separation projects and defining project boundaries**. The MWRA assessed the hydraulic impacts of sewer separation to eliminate CSOs but avoid the risk of system flooding. The Authority will also develop site-specific mapping to show alternatives and recommendations. These projects will proceed to design and construction.
- **Evaluating the feasibility of combining, relocating or eliminating CSO outfalls**. The Authority investigated ways to reduce the number of permitted CSO outfalls, relocate CSOs to less sensitive discharge locations and limit the number of floatables control locations. Hydraulic analyses were performed for various interconnected outfalls, starting with the least active and taking into consideration receiving water and discharge location sensitivity to determine which projects will proceed to design and/or construction.

The CSO facilities planning schedule calls for completion of a draft facilities plan and environmental impact report in October 1996 and a final document in April 1997.

(BMPs/Continued from page 3)

- Preventing pollution at its source;
- Using non-structural approaches;
- Tailoring controls to specific drainage areas and watersheds; and
- Involving the community.

A draft BMP report will be available in early 1996 and will provide each community with an assessment of the effectiveness of its existing BMPs. It will also provide recommendations for further BMPs for long-term management of flows and pollutant loads.

CSO TECHNICAL ADVISORY COMMITTEE (TAC)

The MEPA-appointed Technical Advisory Committee (TAC) meets monthly to review proposed plans for the project, including siting and technical reports. The members include residents of Boston, Cambridge, Somerville and Chelsea; and local community and DPW officials; and members of conservation, business and environmental organizations. Chairman Lydia Goodhue is a member of The Boston Harbor Association and the MWRA's Wastewater Advisory Committee. She has been an active participant in metro-Boston wastewater planning efforts for many years.

Meetings are held on the third Monday of the month. Members of the public are invited. For additional information, contact Lise Marx, CSO Program, 242-0230.

Looking at the watersheds - III

The Charles River watershed (above and below) is part of a multi-year study to identify pollution sources.

This is the final in a series of three ***CSO Bulletin*** *articles on watersheds. Previous articles appeared in the Spring and Fall 1995 issues. Those articles looked at receiving waters in Dorchester Bay and the Neponset River; Constitution Beach and Alewife Brook; the Mystic River; and the Inner Harbor, including Chelsea Creek, Charlestown, downtown Boston and Fort Point Channel. The Charles River is highlighted below.*

While a considerable number of CSOs currently discharge into the Charles River, non-CSO pollution sources are a bigger problem and cause more pollution. The Charles River Watershed Association is undertaking a multi-year study to identify other pollution sources within the watershed and to identify potential ways to remediate these problems. The MWRA is supporting this effort and will review water quality data as they become available.

The Charles River

The Charles River is divided into two segments for purposes of CSO control. The **Upper Charles River** extends from the Watertown Dam to the Cottage Farm CSO facility near the Boston University Bridge. This segment of the river is classified as fishable and swimmable and supports many recreational uses, including canoeing, rowing, sailing and power boating. Much of the land along this area of the river is also dedicated to recreation.

Six untreated CSOs discharge to this segment of the river. The CSO plan, estimated to cost $5 million, includes several technologies to improve water quality by reducing the number of untreated overflows in the Upper Charles River to four per year. The technologies include:

- Constructing a new screening and disinfection facility at CAM005, near Mt. Auburn Hospital;
- Enlarging the connection between a regulator and the Charles River Valley Sewer to eliminate the overflow from a one-year storm at BOS032 (along North Beacon St.);
- Installing floatables controls at all remaining outfalls.

The **Lower Charles River** reaches from the Cottage Farm CSO facility to the new Charles River Dam and locks. Like the upper stretches of the river, the Lower Charles is classified as fishable/swimmable and hosts water-based recreational uses. Power boating, sailing, rowing and windsurfing are popular activities in this area. The Charles River Reservation and MDC parks line the river, and paths are heavily used by pedestrians, runners and bicyclists.

There are 13 CSO outfalls located along the Lower Charles, including the Cottage Farm CSO facility, which is the only treated discharge. With the

(Watersheds/Continued last page)

Photos by Karen-Jayne Dodge

QUESTIONS?

The Authority invites comments on all aspects of the CSO Program. Please mail your letters or changes of address to Lise Marx, MWRA CSO Program, 100 First Ave., Charlestown MA 02129. If you have questions about the project or need any further information or would like to be added to the mailing list, please call Lise Marx at 242-0230 or Vincent Ragucci, MWRA Public Affairs Department at 241-6057.

(Watersheds/Continued from page 5)

exception of that facility (MWR201) and Stony Brook (MWR023), CSOs in this segment occur only rarely after large storm events. Most untreated combined sewage entering the Lower Charles River is discharged via Stony Brook.

Three CSO-control projects, estimated to cost $32 million, are planned for the Lower Charles. These will reduce the number of untreated overflows to an estimated four per year, and include:

- Upgrading the Cottage Farm CSO facility with new screens, an outfall diffuser and dechlorination equipment to improve the quality of treated effluent;
- Constructing a screening and disinfection facility for Stony Brook Conduit flows near or upstream of the Ward Street Headworks to treat stormwater and CSO flows from this basin;
- Providing floatables controls for all remaining outfalls.

This plan will provide screening or screening and disinfection for all of the Charles River discharges, including stormwater flow from Stony Brook, which heavily impacts the river. The plan can be revised, if appropriate, after watershed planning efforts have been completed. In the meantime, these plans will result in more immediate water quality benefits by targeting the bacteria and floatables associated with CSO discharges.

Coming next time...

- ***Follow-up on the siting report***
- ***A look at the geotechnical report***
- ***Findings of the draft BMP report***

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CSO BULLETIN

Douglas B. MacDonald, MWRA Executive Director
John F. Fitzgerald, Sewerage Division Director
Michael Hornbrook, Sewerage Facilities Development Program, Director

Volume 4, Issue 1
Winter 1996

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CSO BULLETIN

A publication of the Massachusetts Water Resources Authority's Sewerage Division

Volume 4, Issue 2
Spring 1996

Vice President Albert Gore praised the Boston Harbor Project during an Earth Day visit to Boston.

Vice President Gore approves revised CSO Plan

Surrounded by the majestic USS Constitution, the shimmering waters of Boston Harbor and the city's skyline, Vice-President Albert Gore came to Boston recently to announce the Clinton Administration's support of a scaled-back CSO plan for the Boston area.

The old plan, which would have cost ratepayers $1.3 billion for construction of tunnels to collect overflow, was scrapped in favor of the current MWRA-proposed plan. This plan, which has a $370 million price tag, requires current system modifications and construction of six new CSO treatment facilities and various sewer separation projects.

"This is a great victory for ratepayers," said MWRA Executive Director Doug MacDonald, who credited the MWRA Advisory Board and various communities for helping to oppose the larger plan. "It's a common sense plan that won't change the quality of our efforts, and will cost considerably less. You don't need a Mercedes when a Ford will do just as well."

Under the original CSO plan, ratepayers would have faced a $150 increase a year. With the current plan accepted by the federal government, that increase will more likely be $20 to $30.

Gore was in Boston as part of the annual Earth Day celebrations. He singled out the restoration of the harbor for praise, saying, "Boston Harbor has come a long way, but the job is not done yet. Let's work together to protect Boston Harbor and all of America's waterways."

COMMUNITY MEETINGS

The next round of community meetings will focus on neighborhood concerns about the CSO facilities siting and/or pipeline route recommendations. Meetings will be held in late spring and early summer for the following areas:

CHELSEA

STONY BROOK/ MISSION HILL

CAMBRIDGE

UNION PARK (South End)

CHARLESTOWN

SOUTH BOSTON

EAST BOSTON

Check your mail for meeting notices. For further information, call MWRA Community Relations Coordinator Vincent Ragucci at (617) 241-6057.

COMBINED SEWER OVERFLOW CHRONOLOGY

AUGUST 1987
U.S. District Court orders MWRA to develop a CSO Facilities Plan

SEPTEMBER 1990
MWRA submits CSO Facilities Plan to court. Plan recommends a regional tunnel system

JANUARY 1992
MWRA and EPA negotiate a short-term schedule for data collection and development of System Optimization Plans (SOP)

FEBRUARY 1993
Interim CSO report submitted to EPA/CLF showing the need for reevaluating the regional tunnel system

JUNE 1993
System Optimization Plans for the four CSO communities are submitted to EPA

1993-1994
Baseline CSO-flows report submitted and baseline water-quality analyses completed

JUNE 1994
CSO control alternatives identified

DECEMBER 1994
Final CSO Conceptual Plan and System Master Plan completed

APRIL 1995
Environmental Notification Form filed for recommended CSO projects; commenced CSO Facilities Plan/EIR

JULY 1995
MEPA issued both the Final Record of Decision allowing 15 projects to go to design and the Certificate on the scope of work for the Draft Environmental Impact Report

March 1996
MEPA issued the Secretary's Certificate on the December 1995 report entitled Interim Assessment of Facility Siting

Public reviews MWRA's CSO siting report

After an eight-week comment period, MWRA has completed public review of its *Interim Assessment of Facility Siting* report, which lists possible sites or pipeline routes for 16 combined sewer overflow projects. The report is an important milestone in MWRA's program to control or eliminate CSOs in Boston, Chelsea, Cambridge and Somerville.

MWRA met with residents from these communities to discuss CSO siting recommendations listed in the report and to collect comments on the proposals. MWRA will address these comments in the Draft Environmental Impact Report (DEIR) and Facilities Plan in October 1996.

During the meetings, MWRA responded to important issues raised by residents by:

- Discussing their concerns about potential impacts the project may have on sewer rates, if more flow is added to the system;
- Adding a site to the short list at the request of local residents;
- Checking with other agencies about possibly conflicting site-development plans;
- Working with residents to keep open-space disruptions to a minimum, especially in city parks;
- Planning tours of existing CSO facilities so residents can see what a screening and disinfection building looks like;
- Collecting information on noise levels, odor control and traffic to present in the next round of community meetings; and
- Considering traffic flow issues during pipeline construction, which may affect busy local streets.

The report was submitted to MEPA on December 29, 1995, and on March 15, 1996, the agency issued a certificate from the Secretary of Environmental Affairs.

The Secretary's certificate requires MWRA to include in the DEIR:

- Responses addressing the comments raised in the 23 comment letters received from property owners, agencies, environmental and community groups;
- A detailed and comprehensive analysis of the recommended facility sites and conduits, including costs, engineering feasibility and environmental impact (including water quality benefits achieved by the plan).

The Authority has already notified each property owner by mail if a property has been short-listed for study in the DEIR. Owners of properties not short-listed should stay informed regarding the projects. If there are serious problems with all of the short-listed sites in one area, the MWRA might have to assess additional properties.

Site tours and other information will be offered to residents this spring at meetings or through mailings. If you have any questions on the siting study, contact Janet Rompala, CSO staff, at (617) 242-0230.

For information, contact Janet Rompala, CSO Program, (617) 242-0230.

Projects move into design and construction

The Secretary of Environmental Affairs' Certificate on the Environmental Notification Form allowed several of the 28 recommended CSO projects to move into design and/or construction prior to completion of the EIR. MWRA and the CSO communities have made considerable progress in implementing some of these earlier projects, which will control or eliminate CSO discharges to Boston Harbor and tributary rivers.

"Come on in, the water's fine." Water quality at Boston Harbor beaches, including Wollaston Beach in Quincy, is better than it has been in generations.

Upgrade of existing CSO treatment facilities. In March, MWRA issued a Request for Proposals (RFP) for the design of improvements to five of the six existing CSO screening and disinfection facilities located in Boston, Somerville and Cambridge. The proposed improvements include installation of dechlorination systems at all facilities; upgrade of screens at the Somerville Marginal Facility, which discharges to the Lower Mystic River; and safety and/or reliability improvements at all facilities. The design contract will also address floatables controls at untreated MWRA outfalls. Design is scheduled to commence by June 1996, and construction is scheduled to be completed by September 1999.

South Dorchester Bay sewer separation. Boston Water and Sewer Commission (BWSC) has awarded two design contracts associated with extensive sewer separation work in Dorchester. Generally, the projects involve the construction of new storm drains to remove stormwater flow from existing sewers. The sewers will then have sufficient capacity to transport wastewater flows to the MWRA treatment system. CSO discharges to South Dorchester Bay and its beaches will be permanently eliminated. Design is scheduled to begin soon, and the proposed 10-year construction program is scheduled to begin in 1999. The projects will be implemented by BWSC and funded by MWRA through a financial assistance agreement.

Neponset River sewer separation. In March, BWSC awarded a construction contract for the first phase of a sewer separation project that will eliminate CSO discharges to the Neponset River. Designed by BWSC engineers, the first construction contract is scheduled to be completed by December 1996. The project involves the construction of new storm drains to separately transport stormwater that presently overburdens the sewer system. Other construction phases necessary to eliminate CSO discharges to Neponset River are scheduled to be completed by June 2000. Project funding will be provided by MWRA.

Somerville baffle manhole separation. The City of Somerville has awarded a construction contract for improvements to more than 48 manholes that presently allow, during large storms, the mixing of otherwise separated stormwater and sanitary sewer flows. The construction project, which is scheduled to be completed by December 1996, will eliminate sewage discharges at certain CSO outlets that discharge to Alewife Brook and Mystic River. The project will be managed by the City of Somerville and funded by MWRA through a financial assistance agreement.

Environmental Impact Assessment

MWRA is currently evaluating potential impacts from construction and operation of CSO-control facilities. These analyses will address both short- and long-term impacts that could occur within the study area of each of the 13 proposed CSO control projects. The results of the evaluations will be incorporated into the October 1996 DEIR and Facilities Plan, and used to select a recommended plan.

As part of the assessment, in March 1996, MWRA consultants completed the *Baseline Conditions Report*. This report supplies information on existing conditions in the CSO project study areas for numerous environmental concerns, most notably:

- Land use
- Institutional issues (i.e., education, health)
- Air Quality
- Flood plains, wetlands, and designated port areas
- Noise

In addition, the data gathered during ongoing field efforts will be used to assess the potential impacts of the construction and operation of the proposed CSO control facilities.

If you would like further information about this report, please contact Janet Rompala at 242-0230.

CSO TECHNICAL ADVISORY COMMITTEE (TAC)

TAC members were appointed by Secretary of Environmental Affairs Trudy Coxe to advise her on the CSO Project. TAC meets monthly at the Metropolitan Area Planning Council (MAPC) in Boston.

Committee members bring a variety of backgrounds and interests to the project, from community leaders to engineers.

TAC members review and comment on project documents and strategies, discuss issues of importance to the communities and bring informed citizen participation to the process. Chairman Lydia Goodhue urges interested citizens to attend the meetings. Contact Lise Marx, CSO Program, 242-0230 for information.

The Technical Advisory Committee (TAC) meets monthly at the Metropolitan Area Planning Council in Boston.

Members include: (Back row left to right): Alex Strysky, Charlotte Fleetwood, Paul Keohan, Ann Daughaday, Gulshan Saini.

(Front row left to right): Corneila Potter, Stephen Greene, Kate Bowdich, Lydia Goodhue, Jodi Sugerman, Martin Pillsbury, Vivien Li.

Members missing from the photo: Andrew DeSantis, Thom Donahue, John Hegarty, Betsy Johnson, Ronald Killian, Karen Pelto, Roger Stern, Robert Strelitz and John Sullivan.

Borings: MWRA takes a look underground

MWRA's subsurface investigation program will provide additional data to assist in site and route selection for proposed CSO projects. This information-gathering step will also help formulate realistic design and construction plans and cost estimates. ***CSO Bulletin*** *interviewed the CSO Program's geotechnical expert, Project Manager Bill Levy, to provide information on the program and the borings that are taking place for 11 of the 28 proposed CSO projects. MWRA has notified and compensated affected property owners for access privileges.*

CSO: *What is a subsurface program?*
BL: The program uses soil borings and geophysical surveys to get a picture of the depth, thickness, and engineering properties of soil and rock layers, and to identify possible groundwater and/or soil contamination at proposed project sites.

CSO: *Why is the CSO Program doing such an investigation?*
BL: As part of the site selection process, we need to screen each site for contamination and determine the potential for foundation or other construction-related problems.

CSO: *How did you determine where to drill?*
BL: We searched within a half mile radius of each of the 11 projects to find areas of historic contamination, spills and underground storage tank leaks. We collected existing subsurface geologic and geotechnical data from many sources, including the Central Artery Project. We overlaid this data on sites identified in the *Interim Assessment of Facility Siting* report and, after field reconnaissance to determine drill-rig accessibility and potential traffic problems, we selected drill sites.

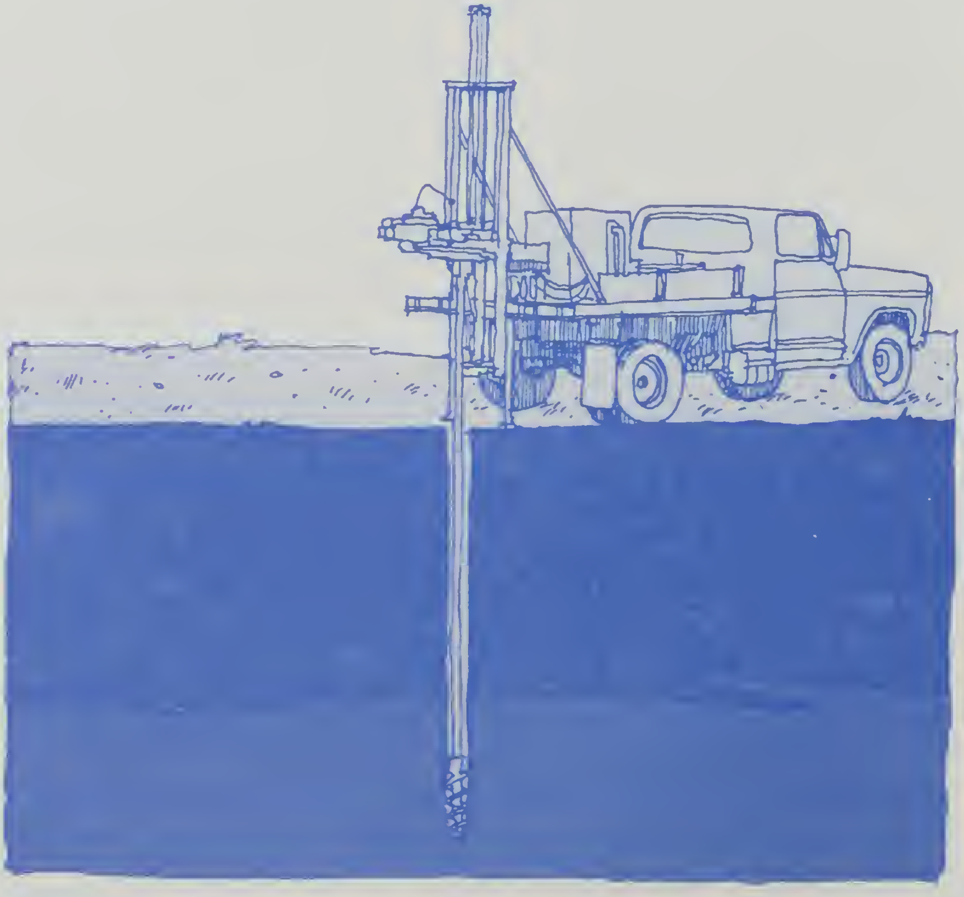
CSO: *How many holes will you drill?*
BL: Ninety-two, 67 of which will be finished as groundwater monitoring wells. Every hole will be screened for volatile organics using a sniffer-type device (photoionization detector).

CSO: *When will the drilling start?*
BL: It started on April 23 and will progress through June 8.

CSO: *How long does it take to drill each hole?*
BL: The time depends on the depth and conditions, but a good driller can advance 30 to 35 linear feet per day. Most holes in the program are 25 feet or less.

CSO: *How many borings per project?*
BL: Thirty-four boring locations are being proposed for the five facility projects, 21 for the three soft-ground tunneling projects and 37 for three interceptor/sewer relief projects. We will also take samples from the bottom of the Charles River and Chelsea Creek from a row boat using a hand-held dredge for the two proposed CSO outfall improvements.

(Borings/Continued on last page)



Drawing by David Macaulay, **Underground**, *courtesy of Houghton Mifflin Co., New York, NY, 1976.*

Photos by Karen-Jayne Dodge

QUESTIONS?

The Authority invites comments on all aspects of the CSO Program. Please mail your letters or changes of address to Lise Marx, MWRA CSO Program, 100 First Ave., Charlestown MA 02129. If you have questions about the project or need any further information or would like to be added to the mailing list, please call Lise Marx at 242-0230 or Vincent Ragucci, MWRA Public Affairs Department at 241-6057.

Coming next time...

- ***Update on environmental review and engineering data***
- ***Findings of the draft BMP report***

(Borings/Continued from page 5)

CSO: ***How do test borings differ from monitoring wells and geophysical surveys?***

BL: Four-inch-diameter test-boring holes are drilled using a truck-mounted auger or rotary drill bit. Holes are kept open with casings or drilling slurry and samples obtained approximately every five feet.

A monitoring well is a soil boring into which a two-inch diameter PVC tube with a slotted screen has been inserted. It is used to measure groundwater levels and to collect groundwater samples that are tested for contaminants.

A geophysical, or seismic refraction, survey is a noninvasive test technique to determine the bedrock surface between test boring locations. It involves measuring the travel time of a sound wave generated from a drop weight or capgun-like device.

CSO: ***What happens to the drill holes after you have obtained all the information you need?***

BL: They are typically filled with a soil and cement grout mixture. Any holes in the sidewalks or streets will be patched with concrete or asphalt to match the existing surface. Groundwater monitoring wells will be left with locking caps to allow continued access for measurement and sampling.

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CSO BULLETIN

Douglas B. MacDonald, MWRA Executive Director
John F. Fitzgerald, Sewerage Division Director
Michael Hornbrook, Sewerage Facilities Development Program Director

Volume 4, Issue 2
Spring 1996

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CSO BULLETIN

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A publication of the Massachusetts Water Resources Authority's Sewerage Division

Volume 5 Issue 1
Spring 1997

Daffodils bloom on the banks of the Charles River in Cambridge.

For your summer reading list: Final CSO Control Plan

The final version of the CSO Control Plan will be completed this summer, moving 26 improvement projects closer to reality. The Final CSO Facilities Plan and Environmental Impact Report (FEIR) will be available by mid-August in libraries in Boston, Cambridge, Somerville and Chelsea and by request from MWRA. While the FEIR may not qualify as a summer bestseller, it will describe how MWRA plans to help improve water quality at area beaches, rivers and brooks affected by combined sewer overflows.

The FEIR will respond to issues raised in January 1997 by the Secretary of Environmental Affairs in her Certificate and by those who attended community meetings or wrote letters commenting on the draft version of the CSO Facilities Plan and Environmental Impact Report (DEIR). In addition to explaining the recommended plan, the FEIR will include:

- Further evaluation to support water quality standards determinations that are required for CSO plan approval;
- Evaluation of a proposed separation alternative in lieu of the Stony Brook (Mission Hill) CSO treatment facility;
- Further evaluation of the need for improvements or repair to the Cottage Farm Charles River outfall; and

*(**Final plan**/Continued last page)*

FEIR PREVIEW MEETINGS

The Final CSO Facilities Plan and Environmental Impact Report (FEIR) will contain some changes from the Draft version of the report (DEIR) released in October 1996. To brief residents in communities where changes have been made from the draft to the final report, MWRA has planned the following meetings:

Mission Hill
(Stony Brook)
June 24, 7:00 PM
Mission Church Music Rm.
1545 Tremont St.
Boston

Meetings to discuss South Boston and Union Park CSO control projects will be scheduled at a later date.

COMBINED SEWER OVERFLOW CHRONOLOGY

AUGUST 1987
U.S. District Court orders MWRA to develop a CSO Facilities Plan

SEPTEMBER 1990
MWRA submits CSO Facilities Plan to court. Plan recommends regional tunnel system

JANUARY 1992
MWRA and EPA negotiate a short-term schedule for data collection and development of System Optimization Plans (SOP)

FEBRUARY 1993
Interim CSO report submitted showing need to reevaluate the regional tunnel-system plan

JUNE 1993
SOPs for the four CSO communities submitted to EPA

1993-1994
Baseline CSO-flows report submitted; baseline water quality analyses completed

JUNE 1994
CSO control alternatives identified

DECEMBER 1994
Final CSO Conceptual Plan and System Master Plan completed

APRIL 1995
Environmental Notification Form filed for recommended CSO projects

JULY 1995
MEPA issued Final Record of Decision and Certificate for the Draft Environmental Impact Report scope of work

MARCH 1996
Secretary's Certificate on Dec. 1995 Interim Assessment of Facility Siting issued

OCT. - DEC. 1996
Draft Facilities Plan and EIR released; 60-day comment period

JULY 1997
Publication of Final Facilities Plan and EIR

DECEMBER 1997
DEP determinations on Water Quality Standards

DEIR reviewers shape final plan

Early this year, Secretary of Environmental Affairs Trudy Coxe issued a Certificate on the Draft CSO Facilities Plan and Environmental Impact Report (DEIR), which recommended 26 CSO control projects at a total cost of approximately $420 million. The eight-page Certificate summarized the plan, certified that it complies with state environmental law and highlighted issues to be addressed in the Final EIR (FEIR).

MWRA held a public hearing, nine neighborhood meetings and several focus-group meetings on the DEIR to explain the plan and encourage comments during the 60-day comment period. More than 40 individuals, organizations and agencies submitted written comments on the plan. According to Secretary Coxe: "the majority of commentors indicated they are pleased with this collective effort and overall approach [to CSO planning]..."

Addressing common issues

Several common themes were evident in the comment letters. A number of individuals and organizations commented on water quality issues, including whether the CSO controls for each receiving water body are appropriate. MWRA has proposed, for example, that a variance of water quality standards be granted for CSO discharges that will remain along the Charles River. Commentors raised questions about this designation. Will other sources of pollution (i.e., stormwater, nonpoint pollution) be controlled while a variance is in place? Will CSO controls be revisited in the future? What are the trade-offs associated with chlorination and dechlorination of CSO flows versus the discharge of minimized untreated flows? Many of these questions apply to other receiving waters as well.

A number of reviewers requested that DEP further explain its proposed process for making water quality

(DEIR/Continued next page)

The chemical feed system at the Commercial Point CSO control facility in Dorchester.

Enjoy the water, but watch for signs

Although water quality in the Boston area is better than ever, beachgoers still need to be alert. You may see one of these signs posted near a MWRA or community CSO outfall while you are out enjoying the water this summer. Notifying the public of outfall locations helps boaters, rowers and sailors avoid them during potential wet weather overflows. Similar information will be available at boathouses and yacht clubs in the near future. Questions about CSO overflows? Contact MWRA Public Affairs at 241-6057.

*(**DEIR**/Continued from previous page)*

determinations that are necessary for CSO plan approval. They asked DEP to describe a public review process and schedule for those decisions. DEP has already answered many of these questions (see following article). MWRA will address these water quality issues in the FEIR and in support of the DEP process.

Community concerns

Many commentors asked about project-specific impacts and methods for mitigating those impacts. Property owners expressed a range of concerns about the effects of proposed facilities and pipes on the use and value of their property. Reviewers generally wanted more details on how construction impacts such as traffic and noise would be mitigated. In some cases, communities suggested project refinements that might provide benefits in reduced costs or impacts. These ideas and proposals will be explored in the FEIR. In many cases, however, these issues will not be fully resolved until complete design details are available.

Overall, commentors want MWRA to continue to be flexible in recognizing opportunities for cost savings and improvements. One project that illustrates the need for this approach is the proposed Stony Brook (Mission Hill) screening and disinfection facility. Boston Water and Sewer Commission (BWSC) is studying whether sewer separation can be implemented as a cost-effective alternative to a treatment facility. MWRA will review BWSC's sewer separation proposal in the FEIR.

Reviewers also stressed the importance of coordinating CSO plans with other regional and community projects going forward at the same time. MWRA will continue to coordinate these efforts through design and construction.

Look for the FEIR to be released in mid-August (see box on back page for locations).

State updates CSO policy

The Department of Environmental Protection (DEP) recently issued for public comment the draft version of a new policy for controlling Combined Sewer Overflow (CSO) discharges. DEP is responsible for setting water quality standards that classify and protect all waters in Massachusetts. The new policy and guidance document were the subject of a series of public outreach meetings in several areas to collect comments on the proposed approach to CSO control. The final policy will be released by the end of the summer.

DEP's proposed update to its 1990 CSO policy is consistent with the national policy issued by the Environmental Protection Agency (EPA) in 1994. The original DEP policy required that CSOs be completely eliminated through sewer separation. Where this was not possible, CSOs had to be relocated away from "critical use" waters, which include public water supplies, public beaches, shellfishing and other recreational areas and wildlife refuges. Where these options failed, a

*(**State updates**/Continued next page)*

*(**State updates**/Cont. from last page)*

range of other control alternatives was evaluated to achieve the best possible water quality without imposing "substantial and widespread adverse economic and social impact." A partial-use designation, which effectively would allow intermittent excursions from water quality standards, was the only option for remaining CSOs.

Changes to policy

The new strategy provides more options for regulating CSO discharges and, as DEP states, "ensures the highest level of public health and environmental protection consistent with the realities of CSO abatement." Although DEP continues to emphasize closing CSOs or relocating them away from critical use areas, new water quality classifications make a clearer distinction between meeting water quality criteria in wet weather versus dry weather. The proposed standards cover a range of situations in which CSOs are found. The new classification of B_{CSO}, for example, indicates that a receiving water still receives CSO discharges, but they have a minimal impact (meeting water quality standards 95 percent of the time or more).

Cost-effective options

DEP's new policy encourages cost-effective options that promote progress toward water quality goals. In light of this approach, MWRA's CSO Control Plan proposes eliminating CSO discharges to four "sensitive" area receiving waters, meeting B_{CSO} or SB_{CSO} standards in eight others, and suggesting a variance for the Charles River until other pollution sources can be better controlled. A variance allows MWRA to comply with its discharge permit through a short-term modification of water quality standards.

The proposed policy is likely to be finalized as MWRA releases its Final CSO Facilities Plan and Environmental Impact Report (FEIR) in July 1997. DEP will consider comments submitted on the FEIR and will hold a joint public hearing with MWRA before it makes a formal determination on water quality standards for all CSO-impacted waterbodies. This procedure is currently scheduled for December 1997.

To obtain a copy of DEP's CSO Policy, contact either Patricia Hannan (617)292-5918 or Yelena Glina (617)292-5671.

It's Back to the Beaches time again. Projects, such as MWRA's CSO Control Program, are helping to make the water more attractive at area beaches, including this South Boston beach.

NINE MINIMUM CONTROLS

At the end of December 1996, MWRA submitted a report to EPA that documents its activities to reduce combined sewer overflow discharges in the near term. The report, Implementation of Nine Minimum Controls for Combined Sewer Overflows, shows how MWRA currently uses specific minimum technologies and controls to lessen CSO flows and their impacts on receiving waters.

The nine minimum control measures are part of a national Environmental Protection Agency CSO policy for complying with the Clean Water Act. The measures combine practical controls – such as maintaining well-operated systems – with monitoring and pollution prevention programs. The report also describes MWRA's efforts to notify the public regarding the locations and activations of CSO outfalls.

For more information on the report, contact Janet Rompala, MWRA CSO Program at (617) 242-0230.

Photos by Karen-Jayne Dodge.

Upcoming CSO Control Activities

Project	Activity and Date	
North Dorchester Bay Consolidation Conduit, Reserved Channel Consolidation Conduit, and Reserved Channel CSO Pump Station	*Design Start*	*July 1997*
	Earliest Construction Start	*Sept. 2000*
	Latest Construction Complete	*March 2005*
Chelsea Branch Sewer Relief, Chelsea Trunk Sewer Relief, CHE008 Repairs	*Design Start*	*July 1997*
	Earliest Construction Start	*Sept. 1999*
	Latest Construction Complete	*June 2000*
Upgrade Existing CSO Facilities: Commercial Point and Fox Point	*Design*	*Ongoing*
	Earliest Construction Start	*Oct. 1997*
	Latest Construction Complete	*June 1998*
Upgrade Existing CSO Facilities: Cottage Farm, Prison Point and Somerville Marginal	*Design*	*Ongoing*
	Earliest Construction Start	*March 1998*
	Latest Construction Complete	*Sept. 1999*
CSO Hydraulic Relief Projects: CAM005, BOS017, Charlestown Branch Sewer Restriction Removal	*Design start*	*July 1997*
	Earliest Construction Start	*March 1999*

Design of CSO facility upgrades moves ahead

MWRA is making progress on design plans to upgrade five existing CSO treatment facilities.

The upgrades at the Cottage Farm, Commercial Point, Fox Point, Prison Point and Somerville Marginal facilities include optimizing treatment and disinfection system performance, and adding dechlorination capabilities to lower the chlorine toxicity exposure to aquatic life.

Enhancing disinfection systems includes upgrading existing sodium hypochlorite storage and delivery systems and adding new sodium bisulfite storage and delivery systems. Sodium bisulfite is used to remove residual chlorine prior to discharging the flow to the receiving water.

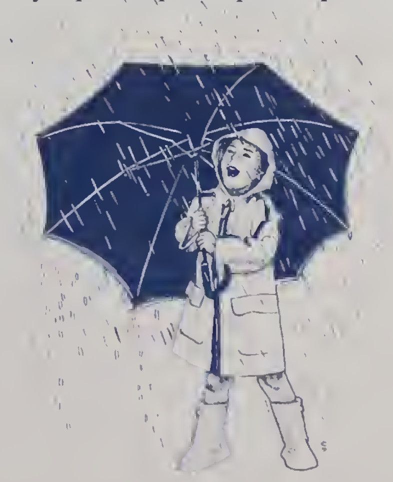
New designs include the installation of underflow baffles in the inflow structures upstream of the Cottage Farm and Somerville Marginal facilities to improve floatables control.

All upgrade designs are scheduled to be completed this year and construction is expected to be completed during 1998-99.

Court approves CSO schedule changes

The Federal Court recently approved MWRA's proposed revisions to CSO-related milestones. The changes were suggested to allow time for additional studies necessary to complete the Final Facilities Plan and EIR (FEIR). Some changes include:

- Postpone submission of FEIR from April 1997 to July 1997.
- Postpone by one year, from July 1997 to July 1998, the design startup dates for the Stony Brook (Mission Hill) screening and disinfection facility, Cottage Farm CSO treatment facility outfall upgrade and CAM005 screening. This will allow enough time to determine, in the FEIR, if a Boston Water and Sewer Commission proposed sewer separation project can eliminate the need for the Stony Brook (Mission Hill) screening and disinfection facility, and to investigate further whether Cottage Farm outfall improvements are necessary. The hydraulic relief project at CAM005 (adjacent to Mt. Auburn Hospital), recommended in the DEIR, will proceed to design by July 1997.
- Postpone by three months, from September to December 1997, DEP's formal administrative determinations for all CSO-impacted waterbodies (or segments thereof). These formal determinations will be filed with EPA and MWRA. They will be accompanied by a public participation process.



QUESTIONS?

MWRA invites comments on all aspects of the CSO Program. Please mail your letters or changes of address to Lise Marx, MWRA CSO Program, 100 First Ave., Charlestown MA 02129. If you have questions about the project or need any further information or would like to be added to the mailing list, please call Lise Marx at 242-0230, or MWRA Public Affairs Department at 241-6057.

Coming next time...

- ■ ***Design and construction schedule update***
- ■ ***Dechlorination: What are the technologies?***
- ■ ***Status of underflow baffle manhole pilot program***

(Final plan/Continued from first page)

- Additional review of the feasibility and cost/benefit of a treatment facility at the proposed Reserved Channel pumping station.

MWRA anticipates that the FEIR public comment period will run from August 10 to early October. The 60-day period will be requested because of the complex nature of the project.

During the comment period, MWRA plans to hold community meetings and a joint public hearing with the Department of Environmental Protection on the FEIR and associated water quality decisions. Look for a mailing in August announcing distribution of the report and the timing of the public hearing.

Copies of the FEIR will be available mid-August in the research sections of:

Boston Public Library branches

Copley Square, Codman Square, Washington Village, Adams Branch, Orient Heights, East Boston, Charlestown and So. Boston.

Other libraries

Chelsea – 569 Broadway
Cambridge – 449 Broadway
Somerville – 79 Highland Ave.
State House Library

Photos by Karen-Jayne Dodge.

♻ *Printed on recycled paper.*

CSO BULLETIN

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Volume 5 Issue 1
Spring 1997

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